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CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India



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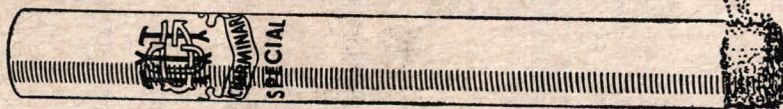
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*SOURCE : POPULATION STUDIES IN MYSORE, U.P., BIHAR AND BENGAL

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TIME TO VISIT THE PARK

Month	Animals to be seen	Weather	Remarks
November	Tiger and crocodile	Cold	Visibility poor due to dense undergrowth
December	Tiger and crocodile	Cold	Improved visibility
January	Tiger and crocodile	Cold	
February	Carnivora, deer, crocodile	Pleasant, night cold	
March	All Wild life	Very pleasant	
April	All Wild Life	Very pleasant	
May	All Wild Life	Day warm, nights pleasant	
June	All Wild Life	Days hot, nights pleasant	

Tariff:

Lodging:	Forest Rest House,	3 suites	... Rs. 15.00 per person per day
	Annexe	6 suites	... Rs. " " " "
	Tourist hutment,	6 suites	... Rs. 5.00 per person per day
	Tents, Swiss cottage,	6 "	... Rs. 5.00 per tent per day.
Boarding	Non-vegetarian	...	... Rs. 12.00 per person per day.
	Vegetarian	...	... Rs. 10.00 per person per day.
Entrance fee	...	...	... Rs. 1.00 per person
Elephant ride	...	...	... Rs. 5.00 per trip of not more than 4 persons.
Camera fee	Cine	...	... Rs. 10.00
	Still	...	... Rs. 5.00
Room cooler	...	...	... Rs. 5.00 per day.
Taxis	...	...	... Rs. 0.86 per k.m. chargeable bothways

Dhikala is the central place in the Park

Distances (in miles) upto Ramnagar	By rail	By road
Delhi-Ramnagar	148	150
Lucknow-Ramnagar	282	235

(Via Haldwani)

Ramnagar to Dhikala is 31 miles (Taxi is available at Ramnagar)

Reservations

Annexe:	Liaison officer D-1/111 Satyamarg, Chanakyapuri, New Delhi.					
Forest Rest House:	Chief Wild Life Warden Rana Pratap Marg, Lucknow.					
Tourist Hutment:	"	"	"	"	"	"
Tents:	Wild Life Warden (CNP) P.O. Ramnagar, Naini Tal.					

The main road to Dhikala is generally ready by the end of November and all other roads by the middle of December.

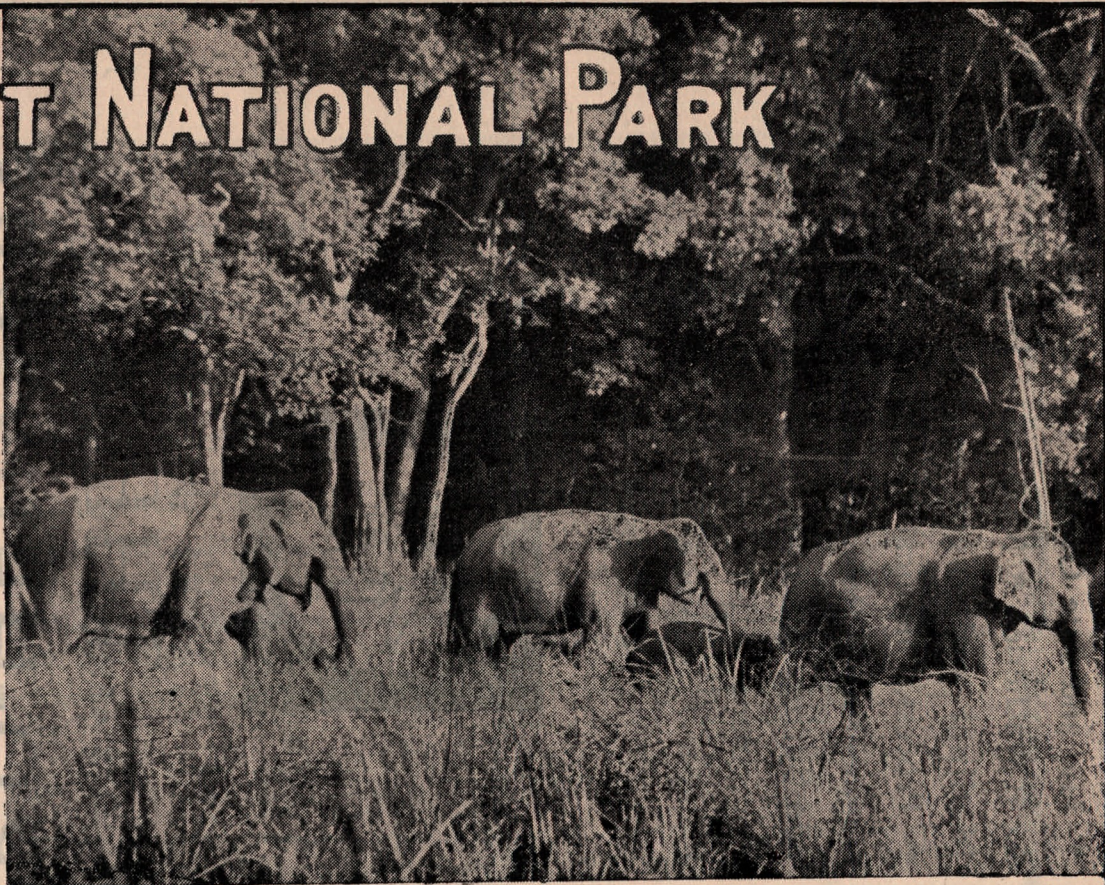
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President's Speech at the eight Annual General Meeting of the Wild Life Preservation Society of India, held on the 29th October, 1966

It is with a feeling of great pleasure that I welcome you all to this Eighth Annual General Meeting of the Wild Life Preservation Society of India.

The Accounts and the Auditor's report have been with you for some time and may I take them as read ?

The Society continues to be running in deficit and vigorous efforts are necessary for the fulfilment of your objectives of serving the cause of wild life preservation.

The most significant thing that has happened since we met last is that the society is now an Organisational Member of the International Union for conservation of Nature and Natural Resources and so we are now not only known in India and by members that we have in other parts of the world, but the name of the society is well known internationally and the society is on the wild life conservation map of the world. We hope for aid and advice from I.U.C.N. and U.N.E.S.C.O.

In November, 1965 an I.U.C.N. and N.R. delegation visited India, and a meeting was organised under the auspices of the Indian Board of Wild Life so that Wild Life workers and enthusiasts here could meet and exchange ideas and information with the members of the I.U.C.N. delegation. The society participated in a joint Dinner given to the I.U.C.N. delegation by a number of voluntary organisations in India working in the field of wild life preservation. This gave an opportunity for informal exchange of ideas and establishment of personal contacts.

The 3rd meeting of the U.P. Wild Life Board was held at Pipri in Mirzapur and the Honorary Secretary of the Society pressed and pleaded for protection to wild life outside Government Forests also. A draft for legislation on wild life preservation in U.P. was considered. It is a comprehensive measure and, if passed through the legislature, will go a long way in conserving wild life in U.P.

The society library has been growing by addition of books and journals and we are grateful to the donors. The library is getting popular among members who borrow books even by post.

Membership of the society is growing and more and more students are joining and this is a very healthy sign.

The North East India Branch has been activated and a very active Bihar Branch is doing much useful work.

We are now producing a better and more useful 'Cheetal', for publishing which we received a grant-in-aid of Rs. 1,000/- from the Ministry of Food and Agriculture, Government of India, through the efforts of Dr. Bainsi Prasad, for which we are thankful to the Government of India and to Dr. Bainsi Prasad. The grant is inadequate and we publish the 'Cheetal' even now at a deficit. Some members have been very active in securing advertisements for the 'Cheetal' and with intensified efforts we may be able to publish three issues of the 'Cheetal' every year.

As an Organisational Member of I.U.C.N. the society received an invitation to an International Conference at Lucerne, Switzerland, but owing to difficulties of foreign exchange the society could not send a representative.

The office bearers of the society, members of the executive committee and some very active members, namely, Shri M.D. Chaturvedi, Mr. E.P. Gee, Mr. M. J.S. Mackenzie, Mr. M. Krishnan, Kumar Arjun Singh and Kunwar Balram Singh have extended the fullest measure of help and cooperation for which we should be grateful to them. But for this we may not have achieved the measure of success that we have.

I thank Mr. R.C. Kaushik, Director of Forest Education, for permitting us the use of the Forest College premises for holding this meeting.

I thank all members and guests for making this meeting a success.

Honorary Secretary's Report at the Annual General Meeting of Wild Life Preservation Society of India, 1966

I am happy to present the report on the working of the Wild Life Preservation Society of India for the year 1965-66.

Membership

Membership continues to grow, but some memberships lapse due to many causes. During the year, 17 Life Members, 17 Ordinary Members, 7 Professional Members and 7 Educational Members joined the Society. The number of Student Members also continues to grow. If each member of the Society enrolled just one member during the year we would be stronger to support the cause of Wild Life Preservation—a cause for which all of us stand.

Cheetal

We publish one thousand copies of each issue of 'Cheetal'. It is growing in popularity and usefulness. We received a Grant-in-Aid of Rs. 1,000.00 (One thousand) from the Ministry of Food and Agriculture, Government of India for publishing the Cheetal for which we are grateful. Because of increase in cost of production, 'Cheetal' is still being published at a loss.

Revenue Account

The Auditors' Report, the audited Income and Expenditure Account and the Balance Sheet for the year is before you, and you will be glad to notice that the deficit of Rs. 758.06 is not much and that the assets of the Society have increased by nearly Rs. 3,000.00 during the year.

Library

The Library continues to grow through purchase of books and through donations in cash and kind, and amongst others we are grateful to Dr. T.H. Bassett who has donated a considerable number of books and journals. We receive a dozen journals in exchange for the 'Cheetal'. More and more members are making use of the Library, even by post.

Research Programme

Work on the Himalayan Wild Life Project continues under Shri Hari Dang and he is drawing up an interim report on it.

General

The Society continues to progress through larger membership and to be more useful by producing a better 'Cheetal', by furnishing advice and information on all aspects of wild life to countries abroad, to State Governments, to the Government of India and to other voluntary organisations and members of the Society.

The Society is now an organisational member of the International Union for Conservation and Nature and Natural Resources and so it is on the Wild Life map of the World and we have the benefit of exchange of information with the I.U.C.N. & N.R. For this credit goes to His Highness Maharaja Sri Pratap Singh of Nabha, President of the Society, whose purse is always open to help the Society help itself, for which the Society is very grateful to him.

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CHEETAL

Journal of Wild Life Preservation Society of India

VOL. IX

APRIL, 1967

No. 2

Ourselves

As we go to the press in this Election Year, it might not be out of place to try to assess the import of political policies on the Society, and on wild life and the Conservation movement in India.

Partisan politics do not directly concern either wild life or the Society's efforts, nor do we wish to enter this charged field of controversy, but in the absence of a clearly delineated or universally implemented National Wild Life Policy, in the absence of Central control upon State policies or implementation, it becomes prudent to ponder over what the elections might herald, especially in this year of severe drought and widespread foodshortage and crop failure.

Anything that weakens governmental authority or undermines the administrative machinery of the country, has direct repercussions on the population of wild life. Crop failure not only leads the poorer and tribal populations to find food-substitutes in the forests, but also even the theory of wild life and forest areas as a 'cushion' against famine, a theory, be it noted, that finds expression and justification in the tribal literature of the Gonds, Baigas, Oraons, Konds and other tribes, as also in Dr. Verrier Elwin's studies, justifies such an inroad upon the food resources of the forests. That the theory is highly practical, can be demonstrably proved in Bihar and Madhya Pradesh and Orissa to-day, where deer population, according to forest and revenue officials, has suffered heavily in the last twelve months. This increased predation by human beings on the wild life stocks has been further facilitated by the clearly somewhat less stringent attitude of authority in an year full of urgent problems, strikes and the lengthening shadow of the elections.

Thus, from our point of view, any result is desirable from these elections which strengthens the forces of discipline, authority and law and order. Wise legislation and effective implementation and execution, upon which the future of wild life depends, can only be undertaken by a stable and strong Central Government, and stable and effective States governments.

Which brings us back to the Society, for only a stable and disciplined system of government, which is the Constitutional aim of India, can have the vision and the wisdom to utilise the insights of research and counsel to publish which the 'Cheetal' exists. It is only when field research, now increasingly being conducted in India, produces the results upon which an enlightened government bases its legislation and execution, that there is any hope of organising the natural resources of this country before it is too late.

* * * * *

Which immediately raises the issue of the Society's research programme. Though field research of a very useful kind and a high order of technical competence is being conducted in India, the unfortunate fact remains that the grants, such as they are, are not being made available to Indian workers, because their sources are largely outside India ! It is only right India should find within its own resources the money for research on wild life, and for the implementation of enlightened wild life programmes. This is not happening. The Himalayan Wild Life Research Project, sponsored by the Society, for which a token grant was received from a Trust in India for the purchase of a camera, is foundering on the rocks of lack of resources, even the lack of basic photographic equipment and expenses of the travel involved in the work. The Blach Buck survey, also undertaken by a Society member, is suffering from the same obstacle of finance. We could name several others of the Society's ideas which are still-born, devoid of the essential pre-condition of financial assistance.

We are not trying in any way to undermine the excellent work being done by people of non-Indian origin within India; indeed, India owes a heavy debt of gratitude to the many enlightened and dedicated conservationists, so many of them still active, who brought to our attention the value of preserving this heritage. We are merely trying to underscore the unwisdom of an approach which, though offering help by way of trained personnel to conduct this or that survey, still does not reach some agreement on the need for training a corps of Indian ecologists. Why not, for instance, a grant to establish a course in animal ecology at the Department of Botany of an Indian University or at the Forest Research Institute, Dehra Dun, instead of a grant for studying the Gir Lion? A study of the Gir Lion, no doubt, would be very useful, but the training up of five Indian zoologists or foresters in the techniques of such study would be very much more so ! For these five would generate further researchers

in the field by passing on their competence, and as such a professional cadre of trained ecologists could be built up to unravel all the problems of wild life on the Indian scene, instead of leaving the work to be done piece-meal by visiting ecologists, however eminent. Even this would, of course, call for the co-operation, indeed, the initiative, of the Central and States Governments, but there is no reason to presume that such initiative would not be forthcoming.

* * * * *

A recent remark by a friend in Madhya Pradesh, not the first of its kind, leads us to offer in cold and deliberate print this clear exposition of the Society's position, not the first of its kind either. He said that he very ardently supported conservation, but did not quite see the relevance of the Society, since, for all its preservation noises, there was not one single thing that the Society did towards conservation and the preservation of wild life; there was, he insinuated, as much 'shikar' material in the pages of the 'Cheetal' as there ever was on conservation !

A fair analysis of our coverage, but it misses the vital points. We have never claimed to be a group of eccentrics or elderly landladies with a passion for the SPCA, or for injured puppies and ill-treated ponies. The Wild Life Preservation Society of India, as anyone who cares to read the aims and objects as listed on the inside-front-cover will learn, has a complex motivation and a composite membership. We are, as we at Astley Hall see it, a clearing-house of information on all matters connected with wild life. We try to keep ourselves posted with all that is happening in this field, and we try in our humble capacity to co-ordinate such work, to disseminate information, to aid departmental efforts, to indicate areas of need to encourage sportsmanship in 'shikar', to recognise such well-regulated and legitimate 'sport' as beneficial to the conservation effort, and even to help in the procurement of permits where possible, for shooting, fishing, photography etc. Finally, we try to carry out programmes of research, independently or in collaboration with other individuals, societies and departments; all this should give a picture of pragmatic enthusiasm for everything wild. This does not preclude the enthusiastic legitimate 'shikari', nor does it leave out the passionate devotee of a more non-violent, sentimental, or technical approach. All our work has a conservation bias; all our coverage in the 'Cheetal' has a slant towards preservation. This is all we have ever claimed to represent. If the 'Cheetal' falls short of the Ideal we pursue, the weakness is in the pursuit and not in the Ideal; and also, the weakness is in the shortage of finance. If our research programmes, publicity efforts or co-ordination and information plans do not achieve the success we hope for, the shortcoming, again, is in the funds within which we have to manage.

It is this consideration that 'makes calamity of so noble a work', to coin a phrase. We are only too painfully aware of the difficulties of finance which set absurdly modest limits on our field work as in our publications. Since 'foreign aid' is proving a chimera or an 'other-reliance' that saps our own initiative and vigour, we have again to think of what we ourselves can do. Membership alone can solve this problem, for it is not too much to hope for, that every town of India of cognate size to Dehra Dun, can produce the members which we have collected from here, both ordinary, and 'student' members.

The student community of India, especially those to whom the 'Cheetal' is accessible, let us say, the 300 schools or so that take the Indian School Certificate Examination each year, alone can provide a membership of a few thousand, all of whom drawn from those who will eventually provide most of our forest officers and other administrative leaders. Our membership in this class has shown a steady rise, and it is to be hoped that our search will reveal a sufficient number of schoolmasters amongst these schools to help us in this effort of inducting student-members.

Editorial Notes

Wild Life and Food Scarcity:

We have already touched upon the relationship between our country's continuing, and may we call it, chronic, food shortage, exacerbated in these last two years by a concatenation of several unfortunate circumstances, like floods, drought and unseasonal rainfall. Particularly in Bihar and Madhya Pradesh this problem has gained critical proportions, and the pressure of the population upon the food supply is telling forcefully upon the wild life population of those two States.

At the risk of dwelling upon generalities, we must face the fact that in the past decade, when the worst excesses of the post-independence era of *laissezfaire* have been toned down, if not altogether curbed, the only positive gains in Conservation have been a greater willingness to face the problem and to investigate the situation. The basic threat to wild life populations remains unaltered, and the consequences are increasingly becoming apparent.

Bihar and Madhya Pradesh may appear to us to be flagrant examples, being possibly worse-effected than other States because of the foodshortage, but we cannot for a moment forget that in littleknown areas, little-known species are the ones that are suffering even

more, possibly being driven to the point of no return. In the Himalayan States, as surely as in Assam and Rajasthan, rare species are being decimated in ignorance.

But it is with the direct bearing of food resources upon wild life that our present note deals. We have consulted the tribal literature of India, as recorded in the books and notes of noted sociologists and anthropologists, and find that the theory of the 'cushion' which wilderness areas and wild life populations provide, is buttressed and borne out by the belief of the tribes of forest-India in the providence of the forests when crop failures or other calamities lead to famine. Such a providence is now one of the main stays of certain of the wilder tribes, the Baiga and the Gond, the Kond and the Chirwa and the Oraon. During an extensive tour of the effected areas this winter, one of our correspondents found a fruitful reliance upon 'game populations', which are being netted, arrowed, trapped and shot for food, and food alone, over vast areas. Quantitatively the food output of these forest areas may ill compare with the 2 million tons of U.S. food, but the psychological, moral and, for the marginal populations concerned, actual impact of this source of food is immense, and should be utilised to reinforce the conservationist plea in favour of more efficient use of this resource for the future. No argument can be more just or pertinent for Indian conditions, than this utilitarian approach.

Sport and Tiger Skins:

Tiger and panther skins have for some years now been fetching fancy prices in foreign, and hence, in Indian markets, since export of these skins is liberally permitted. This year, the market has hit an all-time high, with tiger skins fetching between two and three thousand rupees in India. We can only estimate the prices abroad. Changing fashions, and the reinstatement of the value of tiger trophies are responsible for this vogue, but the effect on the tiger population of India may well be alarming.

Such bloated prices offer an almost irresistible inducement to the poor villager armed with muzzle loader or match lock, or worse, to add his mite to the general destruction of this finest of Indian fauna. To make things worse, the increasing toll of the 'game populations', the deer and the antelope and the pig, which is the result of food shortage, is turning the tiger of whole forest areas into cattle lifters, which further endangers them, for a cattle lifter does not enjoy even the modicum of protection afforded the law abiding tiger, and may be hunted irrespective of season or method, more or less.

Either we must ensure a steady food supply of natural 'game' for the tiger population of the country, which can then be 'cropped' for sport, or we must permit the hard pressed carnivores to prey off cattle populations. This latter alternative, though probably beneficial if the tiger would only kill the dry or old or decrepit cattle, is not likely to be acceptable, as in general tiger pull down the healthiest and most useful of the cattle herd.

There are whole divisions, where almost every tiger is a habitual, and *every tiger an occasional*, cattle lifter: ideal conditions for the extermination of the tiger. It is our opinion that one way out of this muddle caused by imbalance of predation against 'croppable surplus' of 'game populations' is to remove all external stimuli to the killing of tiger, by imposing an at least temporary ban on the export of tiger skins for commercial purposes. Whether such an imposition is workable is debatable, but an attempt should, at any rate, be made; it would, at least, reduce the incentive on tiger skin collection. The present premium on this 'commodity' must somehow be discounted, by whatever methods.

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Zoos' Who's Who

The heartening news reports which informed us of the recent acquisition of a snow-leopardess (*Felis uncia*) cub by the Delhi zoo, followed closely by that of a pair of clouded leopard (*Neofelis nebulosa*), also by the same zoo, makes it advisable for the zoos of India to work out some co-ordinated arrangement for exchanging knowhow and technique on the care, upbringing, and study of their less-known species. Indian zoos have still a long way to go to fulfill adequately a zoo's functions. Not only aren't all the species of India represented at any zoo, but also, there appears to be a general inability to deal squarely with the many work-a-day problems. In this regard, the role of the pioneering Directors of the Delhi zoo, and the far-sighted Departmental officers concerned, is worthy of appreciation. We hope that we will soon be hearing of research work on the less known species being conducted and publicised by the zoos all over India.

To begin with, an inventory of each zoos's repertoire of animals should be made available, and we are corresponding with the zoos over this. Then, it should be possible for the zoos to get together in a concerted plan for the procurement of all the species, with the collaboration of the government departments concerned. Such 'animal-collecting' expeditions form part of the activity of zoos the world over, and have been the subject matter of more than one film or book. The 'thakin' (*Budorcas taxicolour*), the ibex (*Capra sibirica*), the 'markhor' (*Capra falconeri*), the 'bharal' (*Ovis nabhura*), the 'serow', the musk deer (*moschus moschiferous*), and the 'shou' or Sikkim stag, are not the only animals of India still not found in any Indian zoo, and this, and other omissions, should be expeditiously rectified.

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A Society-Managed Sanctuary ?

To reiterate and emphasise the need for an old and favourite notion of ours, we would like too begin by stating the fact that few visitors make trips to the Motichur or Rajaji

Sanctuaries in the Dehra Dun and Shiwalik Forest Divisions. This is not necessarily the fault of any individual, or of the Forest Department, who undertake the normal quantum of publicity, and are only too pleased to receive visitors. And yet, few visitors avail themselves of this excellent set-up; fewer, still, find the experience very rewarding, as no tiger or big game can be shown at these sanctuaries, and most enterprising tourists have to remain content with a motor car drive around the sanctuaries where roads penetrate. They may see a few 'cheetal', and an occasional sounder of pig or a pair of 'kakar' and some jungle fowl and pea fowl, but that is all.

The potential tourist-value of these two sanctuaries is immense, but we feel that better organisation and publicity, more intensive 'training' of the wild life, especially of the big cats and of other deer, with the help of 'bait' and salt licks, is necessary to ensure a good viewing. Similarly, better food and other comforts are needed to lure family parties of visitors.

We feel very strongly that this calls for an unorthodox departure from accepted practice. Either both or one of these sanctuaries should be 'leased', on terms and conditions which can be negotiated, to the Wild Life Preservation Society of India, for, say, a period of five or, preferably, ten years. The Society can then, while observing all the rules and regulations, 'manage' these sanctuaries with a view to guaranteeing a good showing of the wild life to an increasing influx of tourists. Whatever wild life revenues the Forest Department has been earning from these sanctuaries would be paid to them by the Society. In this way, we would get an opportunity of demonstrating what efficient management of a sanctuary can mean to the tourist trade! Though there are some procedural difficulties, these need be no insuperable bar. There can be no insuperable objection to such a wholly healthy idea.

Nor would such a 'farming out' of a sanctuary be completely unprecedented for Oliver Carruthers, a retired tea planter in Assam, is already starting a Tourist Camp within the Manas Sanctuary, though under substantially different conditions. Here is a novel and impeccable constructive suggestion for improving revenues from these two sanctuaries, and we will be pushing our plan with the Forest Department with a fair measure of optimism that the U.P. Forest Department, so enlightened in so many ways, will offer it their favourable consideration.

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Tourist Map of India:

This several-volume map of India has recently been produced by the Tourist Department, and though excellent in many ways, has several serious lacunae. For one, the Corbett National Park has not even been mentioned in the two relevant maps. Such lapses are

what cause poor response to the other forms of publicity given to Sanctuaries. We hope the Department concerned will rectify this omission in their next edition. These maps are for sale at 75 p per volume.

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The Indian Forest Service:

Though details of the decision, like the arrangement for recruitment, allocation to States' cadres, specific terms and conditions of service, etc., are still not available, it is in order for us to welcome this long-awaited re-organisation of the Forest Service of the country.

We learn from our forest officer friends that a certain amount of regrouping within States' cadres has already taken place, and that the Indian Forest Service will be treated at par with the Administrative and other Central Services. We welcome this belated but nevertheless most pressing administrative reform. The Union Public Service Commission will advertise the recruitment, which will be on the basis of an open competitive examination. We hope to see the Forest Service reach ever better professional standard of ethics, to improve upon the past traditions, which in themselves are worthy of respect. We also express here the hope, once again, that out of these changes will come a greater specialisation within the Service.

We are informed that not only are there no forest officers trained for specifically wild life duties, but also that those who do have some degree of zoological specialisation, are not always adequately used, being too often wasted upon non-specialised appointments. There are evils in excessive specialisation, but in the 1960s we just have to get used to the necessity of specialisation to ensure effectiveness. The days of the generalist administrator are past. Life, and forest and wild life management, too, require expertise and competence which a generalist background cannot provide.

Shooting Privileges of Forest Officers:

It is not often that we feel compelled to defend shooting privileges, but we were astonished and distressed to learn that there has been a severe curtailment, amounting virtually to cancellation, of the traditional shooting privileges of forest officers in the U.P. forests.

According to the latest information available, forest officers, whether on duty tours or not, can only shoot in those shooting blocks in the first half of the month, which are not booked for anyone during the second half of the month. Since almost all, even marginally shootable blocks, are always booked during the second half of the month, it appears that forest officers, even while camping in the forest, cannot legitimately go out with a gun of an evening for a stroll and to pick up the odd 'murchi'! This, to our mind, would not only remove most of the adventurous incentive from forest work, but also deprive wild life of the friendship and

sampany of their truest ally, the sporting forest officers ! We do hope that wiser second thoughts will prevail in this matter, and that, however controlled against excessive or unscrupulous abuse, the long-standing privileges of forest officer which alone can bring them into close touch with wild life, will be reinstated.

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Shooting in the Hill Areas:

Though the shooting rules and seasons, very often irrational, which apply in the hill forests of Himalayan India are not familiar to us in detail, we have had occasion in the past to remark upon the anomalous shooting seasons in the U.P. and Himachal; we have now learned that hill-forests of U.P., classified as Old Reserves, have a system of unlimited shooting rights for all residents who may be in possession of weapons. There is no shooting permit for these 'sportsmen' of the hill villages, nor is there any hope of being able to impose such a system of controlled shooting, because of the hereditary nature of these privileges. We presume that political considerations make such imposition unwelcome, but we do feel that when the good of the wild life heritage of the country is at stake, political expediency must give way to political integrity.

In the New Reserves, the shooting rules and seasons are still largely haphazard, but there is at least a genuine effort at some sort of control. We hope that some method of extending even these haphazard rules to the Old Reserves will be found soon, to prevent the decimation of Himalayan fauna which continues unabated.

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Research on Pea-Fowl:

To confirm, or discredit, the oft-reiterated but never demonstrated view that pea-fowl eat the eggs of jungle fowl and pheasant, the Society, in conjunction with other interested individuals, and with help from the forest department, plans to conduct research on the behaviour and ecology of the pea-fowl, preferably in the Dehra Dun region, though findings from other parts of the country would be needed to give credibility to the result.

We would be glad to hear from others who would like to help with this projected enquiry. We already have the assurance of the forest department that they will co-operate in this urgently needed work.

Jungle Fowl:

We highlighted the danger, in our last issue, of allowing the pea-fowl, which has been given protection as the National Bird of India, to drive the jungle fowl, which is a coveted and much hunted game bird, out of plentiful abundance, if not out of actual existence.

The situation has become clearer and more acute in the last season. Both pheasant and jungle fowl have lost much ground against their bigger cousin. The situation will worsen each year, unless some form of 'cropping', or controlled shooting, of the pea-fowl is permitted. There is no danger at all of extinction of pea-fowl, to whom the religious and emotional protection of the populace is sufficient guarantee of continued and increasingly flourishing populations.

The Life of the Red Jungle Fowl in North Central India

By

NICHOLAS E. COLLIAS

Many years ago, in his book *The Variation of Plants and Animals under Domestication*, Charles Darwin (1887) developed evidence that the Red Jungle Fowl (*Gallus gallus*) is the principal if not the sole ancestor of domestic breeds of chickens. In general, more recent studies (Wood-Gush, 1959) have supported his contention although Hutt (1949) has cautioned against complete acceptance of this monophyletic theory. A study of the ecology and behaviour of the Red Jungle Fowl should, therefore, help explain the origin and effects of domestication. Such a study should also be useful in giving perspective to the very numerous scientific investigations of the biology of the Domestic Chicken by describing the natural conditions under which the characteristic traits of this the world's most numerous and valuable species of bird evolved.

Delacour (1951) has reviewed the taxonomy and distribution of the various species and races of jungle fowl. The Indian race is named "murghi," after the common Hindi name for chicken. The classical study by William Beebe (1926) of the ecology and behaviour of the Red Jungle Fowl has been the definitive account of this species in nature. We had long been interested in this important bird and were greatly pleased when grants from the United States National Science Foundation and the John Simon Guggenheim Foundation made it possible for me and my wife to travel to India and attempt to add something to Beebe's fine description of the life of the Red Jungle Fowl in its natural habitat. Many officials, colleagues, and friends in India, Ceylon, Southeastern Asia, and the United States of America graciously extended their aid to our endeavour, and to all of them we are most grateful. Our headquarters

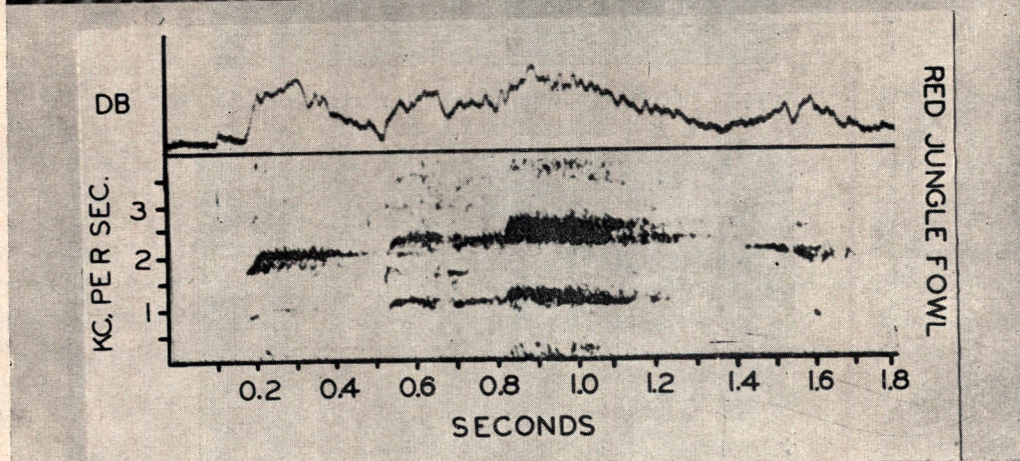
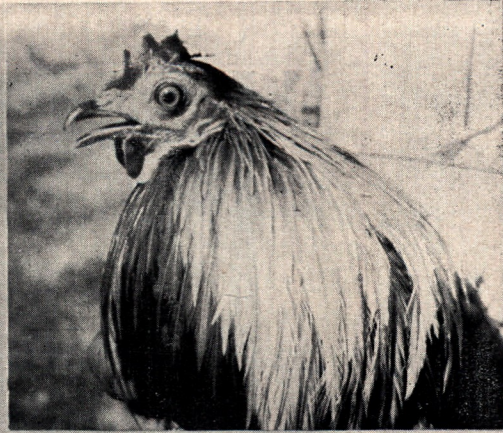
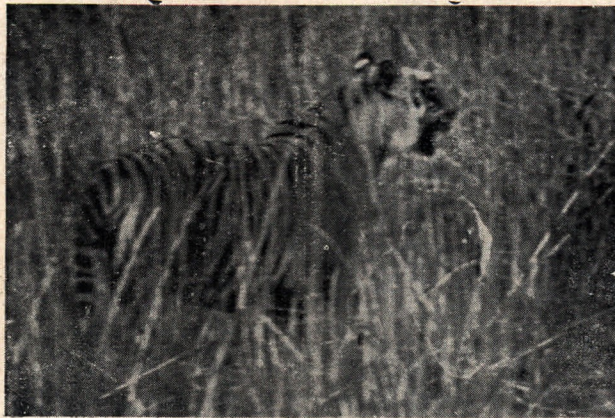


Fig. 5

- Fig. 1. This typical water hole in Dholkhand Rao was observed with a telescope to ascertain drinking times of jungle fowl during the dry season.
- Fig. 2. A small comb Red Jungle Fowl cock shortly after being captured in June, 1963. Such birds are usually of low dominance status.
- Fig. 3. A large comb Red Jungle Fowl cock shortly after having been captured in June, 1963. Such birds are usually of relatively high dominance status.
- Fig. 4. A downy chick of the Red Jungle Fowl about one week old. Note how the plumage pattern matches the natural surroundings on the forest floor.
- Fig. 5. Spectrogram of the crowing of a cock Red Jungle Fowl recorded on tape in the Corbett National Park, April, 1963. The four main energy peaks are here measured in decibels.



THE FURTIVE SENSE OF JUNGLE FEAR



CAT OR KILLER ?
(For reference see Page 33)

were in Dehra Dun, where the Wildlife Preservation Society of India kindly sponsored the study and was most helpful through its Honorary Secretary, Dr. R.N. Misra, and its former Honorary Secretary, Mr. G.K. Singh Mann. We are also very grateful for advice and assistance to the Bombay Natural History Society, the Forest Department of the Government of India, the Forest Research Institute at Dehra Dun, the Chief Wild Life Warden, U.P. and the Wild Life Warden and his assistants at the Corbett National Park. Our investigation of the Red Jungle Fowl was conducted mainly in the Saharanpur Forest Division, and we wish to thank Major D.S. Shiva, the D.F.O. of this forest division and his staff for their friendly cooperation and encouragement.

We made our observations of Red Jungle Fowl during the months of April, May and June during the main breeding season of this bird in north central India. We had earlier observed much the same times of breeding, although more prolonged, in the free-ranging population of Red Jungle Fowl in the San Diego Zoo of southern California. (Collias, *et al.*, 1966). The latter is a locality of winter rains in contrast to north central India in which most of the rainfall comes during the summer. Breeding conditions of domestic fowl can be stimulated by increased day-length, and it is probable that changes in day-length, rather than drought or rainfall, control the seasonal breeding of Red Jungle Fowl. However, rainfall is of indirect importance, being related to the occurrence of the mating flight of termites, which in turn, are most common when there are many young jungle fowl chicks to be fed.

Habitat, Food and Abundance

We located jungle fowl for study especially by listening for the dawn crowing, but also by cruising the roads in an automobile, by searching within the forest on foot or from elephant, and by quiet waiting at likely spots in a machan or from hides. We used binoculars at all times, and also a telescope trained on a water hole during the dry season.

The term "jungle" is derived from a Hindi word, "jangal," referring to forest, arid country or waste ground, and is now often used to mean an impenetrable thicket or tangled mass of tropical vegetation. It is too vague a term to be a good guide to the specific nature of jungle fowl habitat. Our film illustrates specific habitat relations of jungle fowl in north central India (Collias and Collias, 1965), and some details will be described here of the habitat.

Counts of crowing frequency as well as visual observation enabled us to gain some idea of variations in local abundance of jungle fowl. We found jungle fowl most abundant in the vicinity of the Dholkhand Forest Rest House in the Saharanpur Forest Division, particularly in areas least frequented by people. The vegetation consists of an upper storey of Sal trees

(*Shorea robusta*) with scattered large banyan trees, of a middle storey of small fruiting trees and an understorey of tall herbs (especially *Adhatoda vasica*) and in places tall bunch grass (*Saccharum arundinaceum*). The undergrowth was sufficiently spaced out so that jungle fowl could readily walk about between the plants. Termite mounds were common. There were several water holes in the area that the jungle fowl could visit to drink.

One important reason for the relative abundance of jungle fowl in this area lay in the food supply. There is a succession of many kind of edible fruits available at the different seasons. For example, during our visit in the springtime, a small tree, Chamro (*Ehretia laevis*), that was very common in this locality was bearing abundantly and jungle fowl were seen perching in the branches and eating the small red fruits. Jungle fowl were also seen eating the fruits of banyan trees where these fruits had fallen to the ground under the tree. Holdsworth (1958) has noted that Red Jungle Fowl congregate in large numbers at thickets of Ber (*Zizyphus jujuba*) bushes when the berries are ripening about November, and similarly aggregate about Bhansa (*Adhatoda vasica*) when the seeds ripen. Bump and Bohl (1961) have reported 37 crops of Red Jungle Fowl obtained in the six months hunting season, September to February, from northern India. These crops contained some 30 different kinds of seeds (Sal, Ber, rice etc.), insects of various orders, spiders, and snails. Many of the insects are of course scratched out by birds from under leaf litter, but they will also capture weakly flying insects such as termites. We collected some termites near the Dholkhand Forest Rest House during a mating flight of these insects early one morning in June when flying termites swarmed everywhere. They were identified for us by Dr. P.K. Sen-Sarma of the Forest Research Institute as belonging to the species, *Odontotermes obesus*, the commonest mound-building termite throughout northern India. During the dry season part of the study area was found to have been burned over temporarily resulting in some food shortage for animals. Dung from elephant, buffalo, and cattle was abundant, and jungle fowl could be seen pecking at such dung which contains seeds and various insects.

Another reason for the abundance of jungle fowl near Dholkhand probably lay in the presence here and there of patches of Sarkanda Grass (*Saccharum arundinaceum*), which provides good brood-rearing cover. Most of the broods of small chicks we saw were in or near this tall grass, the spreading leaves of which provides good hiding places for the chicks.

There were four flocks of jungle fowl adjacent to the dak bungalow at Dholkhand in the area where our estimate of population density of these birds was most reliable. Each flock had an average size of 5 birds and the average distance between roosts was about 250 yards. From this data we calculated approximately 2.5 acres (or, one hectare) per bird, referring only to adult birds during the breeding season. Since the entire flock area was available to its component individuals, each bird actually had some 12.5 acres (5 hectares) to range over.

Daily Routine

The day of the Red Jungle Fowl begins with the period of dawn crowing, serving to reinforce the general territorial relations that help keep the flocks spaced out. Before the rains get well underway, the sharp peak of crowing coming shortly after dawn is followed by a secondary peak or rise in crowing frequency as the birds move away from the roost to the water holes to drink. During the early morning and late afternoon feeding periods some crowing is heard particularly as birds from adjacent flocks happen to approach each other. One can follow the birds by the sound when they are not seen. A circuit is followed during the feeding periods, the bird often coming near the roost to rest during the hot parts of the day and again in late evening before going to roost. There is a minor increase of crowing frequency before sunset as the birds go to roost again.

Tests with play-backs of crowing recorded on tape usually resulted in no clear response; however, when near a jungle cock we sometimes definitely managed to attract it and stimulate it to crow back by playing recorded crowings singly in reply each time the bird crowed.

For precise information on drinking times of jungle fowl we focussed a 34-power telescope on a water hole 275 yards from the bungalow. Most birds came early in the morning. In 23.5 hours of observation, 19 jungle fowl visited the water hole. During the hot hours from 9 a.m. to 5 p.m. no birds came, while jungle fowl were again seen to drink in the evening between 5:20 p.m. and 6:25 p.m. Generally the birds came to drink singly or in small groups, and after drinking promptly walked off. Competition with other species for a chance to drink was rare, but we have seen pea-fowl chase jungle fowl from the water hole.

The extent of the daily circuit may be quite limited in undisturbed birds. In two flocks followed on different days by sound of their crowings, the diameter of the area covered was about 150 yards in one case and only about 100 yards in the other. However, the movements of jungle fowl are not always as restricted, and we once saw a cock with two hens cover some 300 yards within 15 minutes in travelling from a mulberry plantation where they had been feeding to their roost on an island in a nearby lake.

Reproductive Behaviour

Before the appearance of chicks it was rare to see a hen without a cock nearby, but at this time we often saw cocks not accompanied by any hens. Such unbalanced sex ratios within flocks emphasize the intense competition between cocks for mates and help account for the pugnacity for which the males are noted. But the birds are very wary and only occasionally were we able to observe fights between cocks in the forest. Cocks with hens seemed to us more often to have larger combs than males excluded from the hens. It is

known for domestic chickens that comb size can be stimulated by male hormone, and this hormone also stimulates fighting and mating behaviour in capons. Subordinate jungle cocks are kept well away from the hens and are attacked and driven back by the dominant male whenever they approach too closely, and as a result usually trail behind at a distance. The dominant cock often has longer sickles and keeps his tail more erect than do the subordinate cocks. Also, he does by far most of the crowing. We have noted that reversals of position in a captive flock of Red Jungle Fowl resulted thereafter in the inhibition of further crowing and of mating by the deposed despot, while there was a greatly increased crowing and copulation frequency by the conqueror. Early in the breeding season one often sees a jungle cock accompanied by two or more hens, but after some hens leave to nest and incubate their eggs, it becomes more common to see just one hen, if any, in company with the cock.

The cock often leads the hens during excursions and also has a special courtship or food call that brings the hens running to him as he scratches about for some tidbit. Two copulations were seen in the wild, both in the middle of April. In each case there was little preliminary action apparent, the hen crouching in the same manner as a domestic hen, just before the male mounted. On dismounting the male partly circled the hen while dropping the outer wing; meanwhile the hen shook herself.

Bump and Bohl (1961) observed 16 nests of Red Jungle Fowl in north central India, and state that the normal clutch size is 5 to 7 eggs with renests having usually 3 to 4 eggs. Bump (1961) gives the incubation period of the Indian Red Jungle Fowl as 23 days, this figure being apparently based on experience with captive birds.

Jungle fowl hens cluck to their chicks as they lead them about. The chicks can fly from a very early age, when $\frac{1}{4}$ grown or less. The colour pattern of downy chicks beautifully matches the buffs and browns of dry leaves as well as the dark shadows of the forest floor. When separated from the parents or when captured, jungle fowl chicks utter distress cries very similar to those of domestic chicks. Very small chicks, 1 to 3 weeks old, that we captured had dull yellow legs, but as the chicks grow older their legs gradually change to dark slaty colour that helps distinguish wild jungle fowl from most breeds of domestic chickens and from most village birds. In captivity at least, Red Jungle Fowl chicks often stay with the mother until they are about 3 months of age, when all the down has disappeared from the body, except on the chin and upper throat.

Behaviour Towards Enemies

It is often difficult to evaluate evidence regarding potential predators of jungle fowl. Stomach contents of predatory animals seem rarely to have been analyzed for jungle fowl,

and the finding of freshly killed birds is uncommon. Among the animals that we were assured by various expert guides and wardens to be predators on jungle fowl were various cats, civets, jackals, hawks, eagles, and owls, while crows, monitor lizards, and certain snakes are said to take the eggs. Man is one of the principal enemies of the jungle fowl. This section deals with responses of jungle fowl to their apparent enemies, and such behaviour was something we could readily observe ourselves in the time at our disposal.

We were greatly impressed, as have been many others, with the very wary behaviour of the Red Jungle Fowl as compared not only with domestic fowl but with most other species of game birds. We can give some details, for this alert and watchful behaviour was expressed in many ways. In attempting to locate jungle fowl for further study by the dawn crowing we found the birds would promptly shift their roost the next night after being discovered and they diminished or even ceased their crowing at dawn. The bird has keen vision and hearing and quickly takes cover on being disturbed. In attempting to avoid discovery it may remain absolutely immobile for many minutes at a time. In its natural habitat the Red Jungle Fowl is not a particularly conspicuous bird and the brown, orange and russet of the plumage are not easily detected against the dead leaves that often litter the floor, while extensive parts of the plumage are blackish and match shadows and burned places on the ground.

Burning off the understory of vegetation by man, presumably to improve grazing conditions, visibility and travelling, appears to be much less common in the geographic range of the Gray Jungle Fowl (*Gallus sonnerati*) in west and south India, and of the Ceylon Jungle Fowl (*Gallus lafayetti*) in Ceylon. The scarcity of fire-blackened areas in the habitats of the latter two species is associated with relatively slight development of black in the plumage of the cock compared with the Red Jungle Fowl cock which has a black breast and belly in addition to the dark tail and sickles. The hen Red Jungle Fowl although not black is definitely darker than the hens of the other two species which differ in having quite a lot of white in the underparts.

The Red Jungle Fowl has many enemies and correspondingly its vocal repertoire contains a variety of alarm calls. Loud cackling cries are commonly given by jungle fowl to a ground predator. The downy chicks make good use of their wonderful concealing coloration, freezing into an immobile attitude when the mother hen utters a harsh alerting note or as she continues her cackling cry advertising proximity of the predator. In situations where danger appears suddenly, calling for instant action, as in the case of a flying hawk, the Red Jungle Fowl gives vent to a quick scream. After a predator has passed scattered birds gradually flock together again, using low, disturbed straining notes that seem to function as a "rally call."

Origin and Effects of Domestication

The Red Jungle Fowl generally inhabits secondary forest of a type that within historic times at least has been produced or maintained by the cut-slash-burn type of primitive agriculture. This characteristic habitat of the species insures its frequent occurrence near human villages in the forests and along with the omnivorous diet has helped preadapt the Red Jungle Fowl to domestication.

Recent studies have illustrated how the jungle fowl might have become domesticated. Thus, it is now well known that domestic chicks on the day of hatching have a strong tendency to follow any large moving object, and that repeated contact with and participation in the act of following such an object greatly strengthens this built-in tendency (Collias, 1952). A similar phenomenon was unexpectedly encountered by Lowther (1949) in India while photographing newly hatched chicks of the Red Jungle Fowl in nature. At first he had to repeatedly catch and replace the chicks in the nest to keep them from running off. But, when having taken his pictures, he walked off he was surprised on looking back to find the chicks following him and once again after being replaced in the nest they followed him away. The aborigines in the range of the Red Jungle Fowl often find nests of this bird in the forest and often keep pets as well, so it is not inconceivable that the initiation of the domestication of the Red Jungle Fowl followed some such course as is implied by Lowther's observations. As the chicks grow up under human care the attachment of the birds to villages would gradually increase under influence of conditioning to the food and security furnished by man as well as to selective forces operating in the direction of increasing tameness.

In general, we found that the effects of domestication on behavior have been quantitative rather than qualitative. The chief difference lies in the extremely wary nature of the wild ancestor of domestic chickens. It was our impression that the Red Jungle Fowl in nature is one of the most difficult of all birds for an observer to approach very closely. Some of its responses to enemies have been described above. It is a strong flyer, unlike the domestic fowl, and often feeds well up in the trees on various fruits. The reproductive behavior of Red Jungle Fowl, including fighting, courtship, mating and parent-young interrelations, as we have observed it in natural populations in the wild and in the free-ranging population of this species at the San Diego Zoo (Collias, *et al.*, 1966) was very similar in each type of population and was also similar to the reproductive behavior of domestic chickens we had observed earlier (Guhl, Collias and Allee, 1945; Collias, 1952). The vocal repertoire is also very similar in wild and in zoo Red Jungle Fowl and in domestic chickens. Spectrograms made from tape recordings taken in nature show that the crowing of Red Jungle Fowl resembles much more closely that of the domestic cock (Collias and Joos, 1953) than does

the crowing of Gray or Ceylon jungle cocks. However, the crowing of the domestic bird is more drawn out and contains more clear-cut harmonics than does that of its wild ancestor. Crowing, whether in wild, zoo or domestic populations of *Gallus gallus* is used to assert dominance and territorial rights.

We found much less behavioral evidence of hybridization between wild Jungle Fowl and village birds than we had expected. When disturbed by an observer on the edge of the forest wild jungle fowl seek refuge in the forest whereas the domestic chickens head back to the village. Such differences in behavior tend to keep wild and domestic birds apart, and each population has greatest survival value in its corresponding habitat. Thus, wild jungle fowl populations continue to remain wild and domestic birds remain closely to and dependent upon man.

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Wild Elephants in the Nilgiris—A Rejoinder

M. KRISHNAN

My observation of wild elephants in the Nilgiris has also been mainly in and around the Mudumalai Sanctuary area and is spread over the past 11 years; it has been quite systematic in 1959, 1961, 62, 63, 64 and 66. I regret my inability to agree with Mrs. Davidar in her note on wild elephants in this area, in Volume 9, Number 1 of CHEETAL (October 1966).

This area is one of the immemorial homes of *Elephas maximus* in India. Reference to the shikar literature of South India of the 19th and early 20th century, to the writings of men like G.P. Sanderson and Col. Douglas Hamilton, will prove this. Since those days the forests here have been extensively and deeply invaded by human colonisation and enterprise, by numerous settlements and agriculture around these settlements, roads, forest roads, lesser paths, canals, clearings, plantations, and the Moyar Project and its inevitable consequences. The wild elephants here have been subject to constant disturbance and harassment, and both the disturbance and the harassment have increased considerably in recent years.

Not infrequently wild elephants here (in particular the big bulls) carry festering gunshot wounds which do not heal with time. Last year a tusker was found dead within the sanctuary area near Masinagudi, and inspection showed that he had died of bullet wounds. Some four years ago a prescribed rogue was shot within the Sanctuary area by Mr. E.R.C. Davidar, an event which must still be fresh in Mrs. Davidar's mind. In March 1959 I followed this same tusker on foot for close on a mile; he was just beginning to turn hostile towards men, and the

wind being unfavourable, I had to be very careful, but I could see him clearly enough and was never more than 200 yards away. At one point he stopped to rub his flanks and forelimbs against a tree trunk, and I saw something spherical and white fall from him to the ground. When he moved on I went up to that tree and found a ball of maggots, three-quarters the size of a tennis ball, on the ground beneath the tree. I must add that he carried several patently festering gunshot wounds on his forelimbs and body.

While governed by powerful instinctive urges and reactions which certainly are better suited to life in virgin forests, wild elephants are definitely sufficiently intelligent to associate men with man-inflicted injuries, and to distrust and hate humanity in consequence. Among camp elephants, more familiar with humanity, I can vouch for active dislike of individual men by elephants, always with good cause. Elephants need considerable territory to live in, and while not strictly migratory, do wander a good deal as seasonal requirements, and food and water supply, dictate: they usually follow well-trodden elephant paths in the course of these wanderings, and the fascinating question, whether they have any race-memory, cannot be discussed here, because here it is irrelevant, though it would be relevant in any discussion of the periodic wandering of herds to the most unlikely places, usually in times of drought and when subject to much disturbance from men.

When their territory is invaded by men and man-made things, and when they are harassed and injured by men, elephants do turn hostile towards humanity. Apart from "lone bulls" (whether these are the master bulls of herds temporarily separated from the herd, or true solitaires), even elephants in herds (normally given to flight at the sight of men) might become aggressive in places where they are much disturbed, as in the Segur and Moyar areas. I cannot discuss these matters here: I have spent many many years studying wild elephants and gaur in several different areas, and in a rejoinder one must be specific, and the expression of mere opinion, without massive evidence in support, would be sufficient. I am convinced that elephants are almost unbelievably more quiet and less destructive in areas where they are not disturbed than in areas where they are, and this applies not to different herds and individuals, but to the same animals. If we take the pains to plan and regulate our invasions of elephant country in such a manner that the great beasts are as little disturbed as possible, and if we refrain from inflicting injuries on elephants, I am quite sure that it will be possible to live on terms of a guarded truce with wild elephants.

Mrs. Davidar is entirely mistaken when she says, "With such wasteful eating habits I am sure they will soon be eating themselves out of existence if left unchecked." No jungle or part of a jungle has been destroyed by wild elephants (or any other large animal, for that matter) eating and trampling down the vegetation, in India or outside it, at any time within the past

two thousand years, and probably much earlier—where there has been no human interference. On the contrary, entire forests several square miles in extent have been completely destroyed, or converted into plantations or Plan Projects, within two or three years by men, and human interference with the balance of nature (as by the introduction of exotic plants) can undermine natural forests more insidiously, but no less effectively. To take the very area to which Mrs. Davidar refers, if someone were to be so foolish as to “check” the predator population of the area, chital and pig would destroy the vegetation, including the many kinds of crops now being grown there, in no time at all.

I have spent days watching wild elephants feeding in the Segur area, in the deeper jungles, and in other areas in the Sanctuary where they are comparatively undisturbed. They are never wasteful in their feeding then. For example, on April 20, 21 and 22, 1966, I spent three consecutive days watching a large composite herd of 45 elephants in the Mudumalai area of the Mudumalai Sanctuary, where the herd was undisturbed by humanity. The herd stayed three days more or less in the same area, feeding and drinking in a vast swampy valley and sheltering and browsing in the hill-forests around it. I was greatly impressed by the methodical, quiet way in which the various parties of the herd fed and moved, and when they had moved to fresh ground, on the fourth day, inspected the ground they had occupied closely and extensively. There was very little trampling down of vegetation or other signs of waste, and except that I had spent three whole days watching this herd, I could not have believed that so many elephants had been in occupation of the area for so long. Treading in one another's footsteps, even the trails they had left behind suggested only a small party of elephants. It is true that wild elephants do tear down bamboo clumps and strip trees of bark, but then bamboo shoots come up next year from the underground stems, and the trees they de-bark are usually fast growing species, like *Kydia calycina*. Anyway, no irreparable damage is ever done to vegetation by wild elephants.

When apprehensive of disturbance from men, and when excited by man-made things, wild elephants are not only destructive, but also exceptionally noisy. Anyone who knows wild animals will understand this kind of aggressive behaviour—demonstrations of a sort, really—when nervous. Wild elephants resent all human intrusions into their territory and will tear down structures erected by men when they can—Mrs. Davidar provides an example of such behaviour when she mentions their pulling down the outdoor toilet of her holiday-home. Wild elephants are always destructive when raiding guarded crops.

Owing to continued disturbance, wild elephants in the Nilgiris are now much more on the move than formerly, usually in small parties and herds, or individually (“lone bulls”, sometimes two or three of them together). Drought and excessive rains, conditions by no

means unknown in the Nilgiris in recent years, also seem to stimulate such wanderings. In consequence, the humanity of the place sees wild elephants much more frequently, and brushes with them, sometimes disastrous, are by no means uncommon. As Mrs. Davidar has pointed out, quite a few people are killed by elephants in the area each year, though only a very few of these killings get reported in the newspapers (the death of a German photographer not far from the holiday-home of the Davidars, some months ago, was widely publicised, but not the circumstances which were, in my opinion, in the elephant's favour). Many of these kills are not acts of wanton aggression or of confirmed viciousness, but are caused by cows with calves, or young bulls, out of nervousness, when men literally run into a herd in the jungles. I am not denying that on occasion an elephant can be most purposively murderous towards humanity in this area. In 1965 I had a bloodcurdling experience here when an old cow from a herd made a determined attempt to get at me; having planned my approach with due caution (there were several young calves in herd), I thought that when I had retreated to where she could neither see nor wind me, I was safe, but she followed me by scenting my footsteps, and till I had the wits to wade through a stream, I felt pretty hopeless and terrified.

Because they now see elephants more commonly, and sometimes have unpleasant experiences of such encounters, and hear of others being killed, people are apt to say that wild elephants in the Nilgiris (and other similar places) are on the increase. There is not the slightest foundation in fact for this statement. On the contrary, it is a provable fact that our human populations have increased enormously, and that our intrusions into the elephant jungles are growing commoner and deeper.

It is possible that profiting from their past mistakes the humanity of the area may yet be able to achieve a less uneasy and tense relationship with the wild elephants, but I do not think this will happen. The Nilgiris area has now become the site of many enterprises, plantations, industries, and Plan Projects. I foresee wildlife preservation failing rapidly here, unless immediate steps are taken to give priority to the wildlife at least in sanctuary areas, and I can see no one trying to do anything effective to initiate such a change of heart. Ultimately I expect the wild elephants here to go the way of all flesh, and the only consolation I can find in the thought is in my own mortality, in the certainty that I will not be there when that happens.

Wild Life Study

J. JUAN SPILLETT

Two human desires—the desire to know and understand and the desire to acquire, can be satisfied by wild life study. Young people in particular want to know why, how, what and when. The eager mind is always alert to learn something new. What better hobby is there than to learn to identify the birds in your district? Or, if birds do not appeal to you, perhaps you would be interested in identifying the mammals, or the fishes, or snakes, or lizards, or turtles, or flowers, or even insects.

Wild life studies also have a practical aspect. It is useful to know which insects are harmful; which birds are insect or seed eaters; which rodents destroy crops and other property, and which plants are useful and which are weeds.

It is satisfying to know some of our feathered friends by their songs. But, wouldn't these melodies have added meaning, and become even more enjoyable if we watch the birds build their nests, lay and brood their eggs, and, finally, watch them make frequent trips to feed their vociferous young with harmful insects from our gardens?

Many birds are territorial. After a male chooses a nesting area, he attempts to coax the female to stay there. This is one of the reasons why, during certain seasons of the year, the bright-coloured males frequently sing at the top of their voices. Early in the breeding season the females wander almost anywhere, subject, of course, to the enticing notes of the neighbouring male bird trying to coax them into his territory. However, the male cannot wander at will without becoming involved in a fight whenever he enters another male's household. Also, it often takes a good many fights to establish the boundary line between adjoining territories of male birds of the same species.

The territorial behaviour of some birds during the nesting season has a practical application in wild life management. Suppose the plant cover is such that there is a cock pheasant on approximately every ten acres of land. A male newcomer will be fought by every cock if he tries to carve out a territory in the midst of the already established kingdoms. A male bird holding a territory has a distinct advantage over newcomers in his own territory and newcomers are usually pushed out of it. Hence, the breeding population in an area cannot be increased by introducing more males, hoping they will coax more hens to stay and nest. The pheasants are polygamous. Therefore, a cock can have as many hens as he is able to coax to stay in his territory, but their staying depends far more on satisfactory nesting cover than on anything the male may "say" to them.

You may not be satisfied to just look at plants or animals, but may wish to collect them. Acquiring materials of a particular kind helps to satisfy the desire of acquisition. You may collect specimens for your private museum or for a larger collection, such as a school. As biology teachers can teach you how to press plants so that they will last a long time or how to correctly label and preserve other biological specimens. Butterflies, moths, beetles and other insects are easily mounted and when correctly labelled may become a valuable addition to your collection or even to a large museum. Perhaps you may prefer live things, such as palm squirrels, snakes, turtles, or fish. However, you must first know their basic needs and be able to provide them.

A word of caution about collecting—it is unlawful to collect many birds and their eggs. Waterfowl, game birds and most song birds are protected by state or federal laws. It is unwise to kill hawks or owls, for most of them are beneficial. However, the house sparrow and the common house crow are not protected by any laws.

Let me suggest some ways to increase your interest in wild life.

First, are there any clubs or organizations, such as the Wild Life Preservation Society of India (Dehra Dun) or the Bombay Natural History Society, in your village or town which are devoted to wild life or conservation and with which you can become affiliated and thereby learn more about wild life through the experience of others? If not, perhaps you and your friends can form such a group to participate in such activities as bird watching.

Second, know the common birds, or mammals, or fishes, or flowers and trees in your area. Many books have been written for the purpose of aiding one to identify birds, mammals, snakes, insects, trees, flowers, etc. Some such books for India are: "The Book of Indian Birds" or "Indian Hill Birds", both by Salim Ali; "The Popular Handbook of Indian Birds" by Hugh Whistler; "Sterndale's Mammalia of India" by Frank Finn; "The Book of Indian Animals" by S.H. Prater; "Snakes of India and Pakistan" by K.G. Gharpurey; "Snakes of India" by P. J. Deoras; "Butterflies of the Indian Region" by M.A. Wynter-Blyth; "Some Beautiful Indian Trees" by Ethelbert Blatter, Walter S. Millard and William T. Stearn; "Indian Forest Ecology" by G.S. Puri; "Flora of India" (in seven volumes) by J. D. Hooker. The price of most of these books is nominal. However, if you do not wish to invest in them, you can always use the books in your school or nearest library.

Third, know your state or national hunting and fishing regulations and why they exist.

Fourth, make a map of your neighbourhood, indicating the different fields and waterways. Mark the bird nests, rodent burrows, wild flowers and trees on your map. Then write down or draw on your map your suggestions for improving this environment for wild life.

The study of wild life is so vast that once you start you will become fascinated by at least some facts of it. Even observant amateurs can contribute much to the relatively small store of scientific knowledge which we have concerning the myriad of living things around us. Once you begin to observe and study the intriguing activities of other living things, you will become enthused and will want to widen your scope of inquiry. Moreover, when you become well acquainted with the wild life in your area, you will be surprised to find how much you know about other areas and how much more meaningful life has become through wild life study.

Wild Life Preservation in Western Districts

By

K.L. LAHIRI

Chief Conservator of Forests, West Bengal.

The Western Districts of this State, viz., Midnapore, Bankura, Purulia and Birbhum contain about 1,583 square miles of forest areas. These forests, till 1953, were under the private ownership and were being indifferently managed since many decades. An inquiry committee was set up by the Government as early as in 1938 for reporting into the actual state of affairs in these forests. Their general conclusion was that the problem of flood, drought, etc., were to a large degree due to the ruination of forests of this region and unless Government plays an important part in their management, such forests will deteriorate further in future with adverse consequences.

Based on this report, the West Bengal Private Forest Act was brought into force in 1948. Subsequently, with the passing of the West Bengal Estates Acquisition Act, 1953, Government abolished rights of all intermediaries in forests which vested with the State. Rehabilitation of these forests and its denizens, that were spared, were taken up by the State and continued in successive Five Year Plans at substantial costs.

In the days of yore the tribal people used to practise shifting cultivation for subsistence. As a result of Permanent Settlement, brought into force in 1793, the zamindars

held the fertile lands of the districts while the comparatively uninhabited hilly and forested regions became the abode of the tribal people who had more or less a free run over such areas. Agricultural production from such lands being low, the tribal people in the lean seasons had to fall back on community hunting for food. In course of time, however, as more and more lands were reclaimed from forests, the tribal people depended on agriculture and started to lead a semi-settled life. Pattern of tribal economy consequently changed with the nomadic tribes getting attached to lands. The community hunting, nevertheless, continued over these forest areas as a matter of customary practice rather than an economic necessity.

When the State Government took over the forest in 1953, the primary step taken was the stoppage of the shooting of wild animals except carnivora in these forest regions. No particular action was, however, taken against the tribal hunt in view of the tribal susceptibility in the matter. Every year, tribals congregate on a particular day of the year and set fire to the forests. The animals are compelled to run for life away from the approaching fire, when they are killed with bows and arrows. The number of people joining such congregations may be as much as ten thousand and thus the damage may better be imagined than described. To add to the misfortune, a considerable number of non-tribals take advantage of the situation and join the wild game with guns and even rifles.

During such congregations, the State Government, from 1958 onwards, gave wide publicity highlighting the ill-effects of such hunts. Attempts were also made to divert the attention of tribal people to other harmless recreations like sports, dramas and such other functions.

The Forest Department is spending annually about thirty lakhs of rupees over these forests in the form of labour wages, a large portion of which is earned by the tribal people themselves. This economic benefit is coming to them in addition to other benefits derived from the Tribal Welfare Department. Consequently, the conditions have become quite changed and discontinuance of tribal hunts will hardly harm the tribal economy.

On the other hand, the damage accruing to the forests and wild life is fantastic. An indication of the damage to wild life alone in these hunts would be available from the list produced below which is not a comprehensive and complete one, as accurate figures are seldom available. It could only be said that the animals killed have been more in number than the figures quoted.

Sl. No.	Name of District	Year	No. of animals killed	No. of persons participated	No. of guns used
1.	Purulia	1962	13 (9 deer and 4 wild boars)	6,000 (900 non-tribals)	5
		1963	42 (12 deer and 30 other spp.)	4,000 (2,000 non-tribals)	—
		1964	12 (5 deer and 7 other spp.) Besides, a large number of rabbits, wild birds, etc. were killed.	5,500 (3,300 non-tribals)	4
2.	Bankura	1962	A large number of rabbits, wild birds, jungle fowls, peafowls were killed.	5,000 (1,000 non-tribals)	—
3.	Midnapore	1964	6 deer. Besides a lot of jungle fowls, peafowls and innumerable rabbits and partridges, including 1 leopard.	13,000 (4,000 non-tribals)	9

The associated evil in such hunts is the burning of forests. At a very conservative estimate, loss of increment in terms of money is approximately Rupees ten lakhs per year.

The loss of Nitrogen is colossal. An acre of forest is estimated to shed 10 maunds of leaves that ought to remain on the forest floor and decompose into humus, ultimately enriching the agriculture down below. With 1.47% of Nitrogen in sal leaves, we lose annually 94,000 maunds of Nitrogen which is equivalent to 4,70,000 maunds of Ammonium Sulphate, only because of this tribal hunt. Apart from the monetary value of this amount of fertiliser, it could have produced an additional 9 to 10 lakh maunds of paddy if it was not destroyed by this practice.

The State of West Bengal is committed to preservation of wild life and consequently, the present policy is to educate the tribal population and the general public accordingly. The Forest Department in association with the Tribal Welfare Department and General administration will like to invest the best part of the wild life fund to make extensive publicity in the coming years to wean away the tribal and non-tribal people of these regions from the destructive practice of a community hunting.

The Fauna of Adilabad District (A.P.)

By

K. BHAKTAVATSAL RAO, M. Sc.,

AND

N. JAYARAM M. Sc., A.I.F.C., D.F.O. Adilabad.

An attempt has been made to bring out the fauna of Adilabad District through this paper. This District is rich in forests.

Adilabad district lies between 18°-40' and 19°-45'N and 78°-5' and 80°-5' E, with a forest area of 2,836 square miles, (7,350 Sq. Kilometres). The mean temperature of this district is 26.5°C and the annual rainfall is estimated at 41 inches (98.5 cms). The average elevation can be taken as 1,200 ft. above sea level (360 meters), with summits rising from 2000-2,500 ft. (6,00 m-7,50 m).

The district falls under Cis Gangetic Zoological area. The fauna and flora of the district is very rich.

Mammals:—There are two kinds of monkeys in this district, namely 'Bandar' (*Macaca radiata*), 'Langur' (*Semnopithecus entellus*). In the deeper jungles mammals commonly found are the tiger (*Felis tigris*), the leopard (*Panthera pardus*), hyaena (*Hyaena striata*). The small carnivores are the palm civet (*Pardoxurus hermaphrodites*), the Mongoose (*Herpestes edwardisii*), the wolf (*Canis lupus*), jackal (*canis aureus*) and the Indian fox (*Vulpes bengalensis*). The sloth bear (*Melursus ursinus*) is found in the forests, while on the banks of the streams the smooth Indian otter (*Lutrogale perspicillata*) is found. Among the rodents are the palm squirrel (*Funumbulus palmarum*), rabbit (*Oryctolagus caniculus*), hare (*Lepus ruficaudatus*), and the common Indian porcupine (*Hystrix leucura*). The Wild boar is very common in these forests. The Bison (*Bibos gaurus*) is found near Udampur, Rajulmadgu, Birsai pet and Masampet. Neelgai (*Bocelaphus tragocamelus*), black buck (*Antelope cervicapra*) and gazelle (*Gazella benetii*) are frequently met with. The Cheetal (*Axis axis*) and the sambar (*Rusa unicolor*) are the representatives of the deer family. *Pteropus giganteus* is found among the chiroptera which also includes small insectivorous 'chimgadars'.

The birds commonly found are peacock (*Paro cristatus*) and the grey jungle fowl (*Gallus sonaratii*).

The poisonous snakes met with in the jungle are cobra (*Naja naja*), Krait (*Bungarus coeruleus*), the banded krait (*Bungarus faciatus*) and the chained viper (*Vipara russelli*). The

non-poisonous snakes are Dhamin (*Ptyas mucosa*), fresh water snake (*Tropidontus piscator*), sand boa (*Eryx johrii*), python (*Python molurus*) and the grass and tree snakes. Chameleon and varanus are very common. 'Mugur' (*Crocodilus palustris*) is found near the river banks and in the deep waters of the Northern forest borders of this district across the Penganga river.

Kalimurrel (*Ophiocephalus striatus*), rohu (*Labeo callasu*), khaul (*Barbus sarana*) are the chief edible fishes found in the forest ponds and tanks. The molluscan representatives are the fresh water mussel (*unio*), apple snail (*Pila*). Important arachnids include jalmandal (*Galeodes*) and scorpions (*Buthus palmnaeus*). A freak of nature, in the scorpion having two tails and two stings, has also been reported from the Boath Range in Adilabad Division.

In the summer (March to June) almost all the streams go dry and water is not available in the breached and unbreached tanks in and around the forest. When the summer is protracted, the plight of the wild life is miserable. An instance where half a dozen cheetal jumped into a well for water and killed themselves by the fall has been recently reported from Udampur. Salt licks have not yet been noticed in these forests.

The Government of Andhra Pradesh Forest Department have been implementing effective steps for preservation of Wild life in Adilabad District by total prohibition of shooting. "Kawal" game sanctuary has been set up in Jannaram Division for the visiting public to witness the rich fauna. Besides, special amenities includidg the erection of watch towers, have been provided in the sanctuary area.

We are extreamely grateful to Sri M.S. Sastry, M. Sc., Principal, Govt. the Arts and Science College, Adilabad and to Sri C.V. Konda Reddy, B.A., A.I.F.C., Conservator of Forests, Adilabad Circle (A.P.), who have extended wholehearted cooperation in bringing out this paper.

Corbett Museum

AN APPEAL

Uttar Pradesh has the distinction of establishing the first National Park in India, and JIM CORBETT, whose memory the Park commemorates, was amongst the early pioneers who first selected the region of the Ramganga Valley as the best site. To him, and to the other pioneers, our generation, and generations to come, are indebted for their vision and foresight.

As the Corbett National Park evokes the spirit of the wilderness, and attracts thousands of visitors each year in an increasing stream, from all over the world, curiosity and interest are aroused about the life and works of the famed sportsman, naturalist and writer, and about the wild life of the areas where he wandered.

Corbett's modest cottage at Kaladhungi situated between Haldwani and Ramnagar along the forest road where he also owned landed property is the obvious choice for creating a museum for satisfying this hunger for knowledge and information, and the U.P. Government has taken the first big step in this direction by purchasing his house and getting it repaired.

To establish the Museum and furnish it with Corbett's trophies, the specimens of the bird and animal life which were his friends, to gather together under one roof a veritable encyclopaedia of the wilderness, is a task which calls for the co-operation of everybody.

To this end we appeal to all sportsmen, all naturalists, forest officers and all men of goodwill who knew Corbett, have received letters and correspondence from him, or have in their possession trophies of man-eaters or other animals shot by him, to come to the aid of the Corbett Museum and make the realisation of this great task possible by offering these trophies and mementos, as well as all other specimens of the wild life of this country. Corbett's interests were many, and his writings, in journals, in letters, articles and his manuscripts, are all extant. Their collection at one place is desirable. We reiterate the urgent need for your help in this noble endeavour, and request your liberal co-operation. Please address all your enquiries or offers to the Chief Wild Life Warden, Uttar Pradesh Lucknow.

All offers of trophies and mementos will be gratefully accepted.

R.C. SONI

Chief Conservator of Forests, U.P.

Economics and Wild Life Management

By

J. JUAN SPILLET*

Many people, particularly in developing countries, believe that wild life does not pay for itself and that wild life sanctuaries or parks are an economic burden on a country. This is not true. Sound economic principles are an integral part of modern wild life management and there are many dramatic accounts of how, through management, wild life has made substantial contributions to the economy of a nation. For example, tourism, based upon wild life management, is the second largest industry in Kenya. India has sold a number of Great Indian One-horned Rhinoceros from the Kaziranga Sanctuary to zoos for Rs. 50,000 each in foreign exchange.

Direct Benefits

The direct benefits of wild life management are hunting and fishing fees or visitor permits. Approximately 40 years ago wild life management in the United States was in the pioneer stages, much like it is in India today. However, hunting and fishing fees and equipment in the U.S.A. now provide a revenue of over Rs. 2,000 crores (with devaluation) per annum. The sale of fishing lures and equipment alone amounts to over Rs. 750 crores per year. This is apart from the employment, taxes, and other benefits resulting from the manufacture and sale of these items. Also, the returns from wild life continue to increase each year, rather than diminish as in many countries. In fact, through planned management some wild life species in North America, such as deer, are now more numerous than they were at the time of the landing of the first white settlers in the early 1600's.

Similar to the present situation in India, many American forms of wild life were brought to the verge of extinction before their value was realized. Through management, some of these have been re-established as valuable harvestable natural resources, and at least limited numbers of others have been preserved for future generations. In the early 1920's the Pronghorn Antelope, which is somewhat comparable to India's Blackbuck, had been reduced to less than 6,000 in all of North America. Through public interest and the work of various state organizations, Pronghorn Antelope now number over 160,000 in the state of Wyoming alone. They are presently one of the biggest sources of income for this state. The state of Wyoming Game and Fish Department claims that each Pronghorn Antelope under its

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jurisdiction provides the state with an annual income of over 50 dollars (approximately Rs. 375) via hunting fees, equipment and ammunition, guide (shikar) fees, food, lodging, and travel expenses entailed by hunters in quest of this animal.

The Rocky Mountain National Park in the state of Colorado (U.S.) had over 2 million visitors during the year 1962. Each visitor paid approximately Rs. 750 in visitor permits just to see the scenic attractions of this park. Areas in India, such as the Corbett and Kanha National Parks, and the Kaziranga and Bandipur Sanctuaries, with proper management and publicity could equal, or perhaps even surpass, many of the notable parks of the world as attractions for tourists.

Indirect benefits

A few of the direct monetary benefits of wild life management have been briefly discussed. However, direct benefits generally constitute only a very small proportion of the returns as compared to the indirect or "fringe" benefits accrued from properly managed wild life.

Many suitable wild life management sites are located in catchment areas. In a modern nation with an expanding economy and population, dam projects are almost an absolute necessity for flood control, irrigation, and power. But, what is the result when an economy based upon the construction of very costly dams rapidly deteriorates because of silting, due to a lack of management in the catchment areas? It is well known that many hilly areas in India are overgrazed by domestic livestock and, even worse, many forest areas unsuitable for agriculture are being burnt and the land cleared for crops. These practices bring the livestock grazer or agriculturist a quick profit, but it is like killing the goose that lays the golden eggs. Should the "rights" of these relatively few people be respected, to the detriment of the majority further downstream, and in reality to the detriment of the entire nation? Studies often demonstrate that all would eventually benefit more if such areas were strictly set aside for managed wild life purposes.

Experiments in Punjab have shown that erosion from plots grazed by domestic livestock was 20,000 pounds per acre, whereas from grassy or sandy areas it was only 273 pounds per acre. Those observations were made on plots of 1:4 slope during a storm of 9.8 inches in 19 hours. The run-off from the grazed plots was 95% of the total rainfall, as compared to 20% from the areas of uncut grass and shrub cover. Generally, soil erosion is 2 to 6 times more from overgrazed areas than from those that are properly managed.

Studies in Africa demonstrated that erosion was substantially reduced and revenue was greatly increased when domestic livestock was replaced by native ungulates. Based upon such studies, Uganda is presently developing a sustained-yield wild life cropping programme.

Natural herds of wild ungulates roam freely over extensive areas and their increase is scientifically and systematically harvested, processed and distributed, much as in many modern meat packing industries. It has been found that up to five times as much meat and other animal by-products can be produced on a given area of land from wild ungulates as compared to domestic livestock alone. It was even found, that when domesticated, the giant eland (*Taurotragus* sp.) produces more milk than the native cattle. The requirements of capital investments in breeding stock, buildings, fences, and labour is also nominal for such a progress, in comparison to conventional livestock farming practices.

Other investigations have shown that the average tourist in many countries spends approximately Rs. 200 per day. Hunting and fishing fees or visitor permits may provide only a nominal source of revenue from tourists. However, proper management, which includes capital investments in accommodations, facilities and publicity, can attract numerous tourists to wild life areas in India and thereby become a boon to the overall economy of the nation. Even at present, how many tourists would visit the Gir Forest if it were not for the Indian Lion? Or, how many would visit Assam if it were not for the Great Indian One-horned Rhinoceros of Kaziranga?

Aesthetic Values

Thus far only a few of the monetary values of wild life have been discussed. But, how do you place a price tag on the thrill of seeing a tiger in its natural setting?—of hearing the hoarse cough of a lion as it roams the forest at night?—of being able to escape from the bustle and trials of modern living to the quiet and solitude of nature?—or, perhaps through being a spectator to the dramas enacted by wild life, being able to relate such situations to man's complicated world and thereby solve some of what previously appeared to be insurmountable problems?

Most men have an inborn love for the out-of-doors and wild life, an instinctive desire, so to speak, to commune with nature. Untold thousands in the crowded island of England, which has a much higher human population density than does India, regularly enjoy the pastime of birdwatching. This hobby is so popular in Britain that a new field guide to the birds led the best seller list of non-fiction books for several weeks.

Peter Scott, the famous naturalist, recently visited India. While in New Delhi, he related how over 200,000 people annually visit his wildfowl sanctuary at Slimbridge to see a "family" of wild swans that he and his wife have coaxed to regularly visit them on their yearly migration from Russia. Upon visiting the Keoladeo Ghana Bird Sanctuary at Bharatpur, he remarked, "It is one of the most incredible places". And, "Enormous numbers of people would want to see such a spectacle".

Even if wild life was not a financial asset, which it is, its aesthetic values alone are reason enough for its preservation and the establishment of parks and sanctuaries. Modern wild life management, like conservation, is the proper use of natural resources to provide the greatest benefits for the largest number of people in the long run.

The Tiger—An Assessment

By

ARJAN SINGH

The tiger has been maligned as well as romanticised and both these facts have been to the detriment of this prince among animals. "As cruel as a tiger" and "as bloodthirsty as a tiger" are idiomatic parlances in the English language which are commonly used, and are a complete travesty of reality. It is worthwhile, therefore, to examine the status of the tiger in his natural surroundings.

The earliest known fossil remains of the tiger were discovered in the New Siberian Islands well within the Arctic Circle, according to Prater, but Central and Northern Asia is believed to be the original home of the tiger. The Ussurian tiger of Mongolia and Manchuria is a much larger specimen than the better known animals of the tropics and sub-tropics where climatic and environmental conditions have modified the tiger as it now exists in South East Asia. The tiger is, therefore, in its original form the largest of the true carnivores, and due to its individuality and surroundings represents the ultimate among the beasts of prey. Its offensive armament consists of four canine teeth of which the lower ones are slightly smaller than those in the upper jaw. Approximately two thirds is enclosed in the jaw bone, and may attain a length of 5-6 inches for a large animal. The claws of which there are five in the fore paws and four in the hind are powerful, and enclosed in protective sheaths. This formidable armament is nature's bequest for its survival, for the tiger is entirely carnivorous. The average tiger weighs between four and five hundred pounds, though an outsize specimen of 705 pounds is mentioned by Smythies in his 'Big Game Shooting in Nepal' as having been shot by the Maharaja. His strength is prodigious and Smythies in the same work mentions a tiger as having leapt up a sheer river bank of 20 feet with a buffalo bait in his mouth. However, though the tiger is the ultimate in killing efficiency he is often hard put to it to feed himself. Often travelling a linear fifteen miles a night, the questing tiger is heralded by the alarm calls of the denizens of

the forest on whom he preys. His strong odour wafted on every stray breeze, often outpaced by the animal he has patiently stalked, it seems the odds are heavily against him, and with the precipitous decline of the deer tribe due to indiscriminate poaching it would appear that the dice are heavily loaded against his survival, for on the availability of food depends the birth and survival rate of the young. Contrary to belief the normal tiger is seldom entirely a cattle killer. The tiger hunts between sunset and sunrise, whereas cattle graze in the day. Moreover, the human association is always present when livestock is killed. And finally pig and venison are more to the taste of the discriminating tiger than a straggler from the myriad bony scrub cattle which clutter the jungle fringes. It is only the imbalance created by the predatory human that forces the carnivora to change its hunting habits. The tiger is supposed to kill twice weekly. This may vary, and sometimes over a week may go by without a kill. When he does the tiger gorges himself and it is astonishing the quantity he can consume. A pig of 200-250 lbs will be almost entirely consumed in a night, which would mean a flesh consumption of well over 100 lbs. These dietary habits, however, seem to suit the metabolism of the tiger, as zoo animals which are fed daily can never hope to attain the dimensions which are common in the wild state.

Enough has been said to show that the tiger has no easy life, and this alone would preclude any wanton destruction of life by predators. True more than one animal may be killed in a herd, but that is when the killer instinct has been aroused and the tiger is a killer par excellence. He does not hunt for sport which is the prerogative of the human, but for survival, which is the instinct of the animal. It is said that one picture is worth a thousand words, and the fact of the crouching tiger is surely not 'cruel', or 'blood-thirsty'. He patiently awaits the departure of the blundering elephant from the vicinity of his kill. With a certain imaginative detachment one might feel like stroking him !!

The tiger epitomizes the romance of the jungle, the powerful forces just outside the flickering focus of the firelight so well portrayed by the lines quoted in Champion's book:—

When sunset lights are burning low
When tents are pitched and campfires glow,
Steals o'er us ere the stars appear,
The furtive sense of jungle fear.

Despite talks of the 'Big Five' of Africa, and the gigantic Kodiaks and grizzlies of Alaska, there is no doubt that the genus panthera is the prize among trophies, which brings us to a comparison of the lion and tiger, the latter according to hunters is definitely the finer trophy, not only because of his flamboyant colouring, but the solitary existence, the jungle environ and the difficulty of catching a glimpse of him is in contrast with the drab coat of

the lion, the open and dry country he lives in and the prides which are so easily met up with. The lion was once found over the whole of Northern and Central India so far south as the Narbada, and it is claimed that the more powerful tiger was the cause of its disappearance from most of India. This, however, is probably not true, as the different type of country they lived in would preclude their coming into contact. What is more probable is that due to their accessibility the lion was exterminated by sportsmen, whereas the tiger survived because of his more seclusive existence. Moreover, according to Gee they are about equal in strength, and certainly the measurements seem to be similar. Jim Corbett used to claim that the tiger was the more powerful animal, and he knew them both in their wild state, but Clyde Beatty the circus performer who had an act of 40 mixed lions and tigers gave the edge to the lion.

The tiger is, therefore, hunted by foreigners as the major trophy animal of the world, and by the indigenous shikari as the relentless cattle-lifting menace who makes the jungle unsafe for democracy. The foreigner brings the much needed exchange, and the declaration of a cattle-lifter, the much needed vote, so where does the tiger stand in the scheme of things. It seems that he is fated to disappear in spite of what is claimed by the pundits of the Forest Department. They say that tigers have increased, but this is not based on census, but conjecture. Tigers are now more readily visible and heard of as with the advance of cultivation to the fringe of the forest, and the rapid diminution of deer due to poaching and indiscriminate slaughter, the tiger is forced to forsake the deep woods, to seek his prey in the vicinity of man and his cultivation.

Secondly, Nepal once the breeding ground of tigers is being heavily felled, colonised, and disturbed, and a local increase in the tiger population may well be due to an unprecedented influx from Nepal. Once this supply runs out, the tiger graph is going to record a steep fall, as the impact of disturbed conditions is going to affect the reproductive processes. The roar of tractors, shouts of men, the presence of innumerable cattle and the burning of heavy grasses in March and April is not conducive to normal gestation, apart from the casualties which are likely among the litter due to these fires. The indiscriminate issue of firearm licences is another menace, and most of the tigers I have seen shot over the last few years have had gunshot wounds.

The tiger is potentially dangerous, but so is a 5-ton truck with a drunken driver. Normally the tiger does not prey on man, hunts at night to keep out of his way, and does not wish to be disturbed. A tigress with young will charge, but in most cases this is a noisy demonstration provided the man does not try to run away. The courting tiger may show his annoyance, and the tiger disturbed on a natural kill may contest its possession, but it is really only the wounded tiger which is fury incarnate. He will charge into a line of

elephants, leaping on to its head and often bringing the mighty pachyderm to its knees. Then it is sinew and muscle facing the blast of cordite, tooth and claw met with high velocity bullets, and uninhibited primeval fury of the beast, opposed by modern weapons and the hope that a few ounces of lead will halt a few hundred pounds of destruction. This is the ultimate excitement wilfully sought by few, though it is the sportsmen's code that every wounded tiger must be followed up. Wedged in between are the various 'Safer' methods adopted to lay this mighty feline low, from sitting over water-holes at night with a powerful torch, or poisoning kills at the other end.

Finally the Maneater—he is the victim of circumstance, usually man-made.

A gunshot wound, or porcupine quill, or other disability by which he is so incapacitated as to take to killing the easiest victim he can find despite the natural fear of the unknown, and the animal does fear the unknown. A larger proportion of tigresses among maneaters would also indicate that the times of stress while rearing a family may have something to do with this condition. Such a tiger becomes a terrible scourge as Corbett's books demonstrate. But this is an unnatural state and even the worst maneater does not subsist entirely on human kills.

The concept of sport has so far been with a rifle, and the phenomenal bags of the nineteenth and early twentieth century will never be experienced again. Africa is a maturer country than India as far as the commercialization of hunting is concerned, and now there is a reaction against killing and many safaris are merely photographic. It is a species of evolution of humanism, a realization that sport does not reside in killing alone, and trophies are not only stuffed museum pieces. Shooting with a camera offers more to a sportsman or naturalist than ever can a rifle. The excitement is more prolonged, as the quickest snapshot of a rifle can never be taken with a camera, which requires more favourable conditions. It is a harder and more individual work, but the results are so much more satisfying as to render any attempt at comparison superfluous. A pair of antlers on the wall, or a mounted skin is of interest only to the individual concerned, and really probably only till memory fades, and the mount loses its pristine freshness, but the photograph outlives time. Every look will bring back the tense thrill of knowing that a good picture has been taken, the many disappointments, and the climax which will never fade. Other observers can also appreciate the feline grace, the sylvan setting and the peaceful surroundings, undisturbed by violence and mortal agony, for death is always ugly.

This article starting as an assessment sounds more like an apologia, but this is in the fitness of circumstances. Memories will fade with time, but India will—one hopes—always remain the land of tigers.

Tiger Hunting Among the Nagas

By

T. ANGAMI

'Last night the evil-doer has lifted a pig, he has humiliated the village and today revenge will be taken. Today is the day, today is the day of tournament: jousts of arms, today the Leader-Bull will be decided.

Among the Nagas, tiger-hunting is not a Sport, and it cannot be a pleasant sport when the hunters have only primitive 'daohs' and spears. The people do not seek an open clash with this 'elder-brother' (ex-communicated because of his crimes). Tigers are hunted only when they create terror in the village, and that too with respect and Ceremony. Whenever a tiger kills a cow or a pig, it sends a wave of commotion through the village, the villagers take it as an enemy to public peace and the whole community goes down to destroy the common enemy.

Early in the morning, some expert hunters follow the pug-marks. They track the animal down to the ravine. The ravine is then surrounded and the trackers look for any fresh pug-marks going out of the ravine. They examine all game tracks, all possible routes of animal traffic, any suspicious sounds or signs, and finally conclude that the animal is still there—all the signs of its presence being positive. The news is then sent to the village. The news that the tiger is within the circle sends a thrill through the villagers. Excited boys run in and out of the houses, and collide with their sisters, hurrying to fetch water from the village well; the man rushing out to hone his already sharp 'daoh' outside, nearly knocks down his wife bringing in an arm-load of firewood to prepare a hasty meal. Already, some have started for the jungle and flashes of light reflected from the spears can be seen as the hunters line along the mountain range.

The hunters enter the jungle as quietly as possible. The veterans encircle the ravine, study the location, the terrain, the topography, etc., and the best possible way of operation is decided. After that, bit by bit, the circle is narrowed down to the extent most convenient for the operation. On the slope at the bottom of the ravine, a V-shaped structure of poles is constructed, with its mouth open uphill. Machans are also sometimes constructed for women and children to sit on, to see the drama soon to be staged. Taking positions, the hunters stand side-by-side and form an arc, enclosing the mouth of the stockade. In taking positions, only close relatives and brothers stand side-by-side. A middle-aged hunter bearing shield, spear and 'daoh' stands close behind a youth, with only one 'daoh'. The youth cuts the jungle in the front, and when a tiger charges out the youth retreats behind the shield (always facing the tiger). The old and aged are stationed behind the wall at the narrow end of the stockade.

When everybody is ready, the youths start cutting the jungle. The jungle is cut flush with the ground, without any protruding stump in the ground, and trees are always felled towards the tiger. This gives precious obstruction to the charging tiger. The hunters do not shout or talk loudly at this stage, but once the tiger roars, it is replied roar for roar, and wild yell for roar. The hunters slowly drive towards the stockade. A thicket previously unlocated appears, an in-experienced youth hesitates to advance and looks backwards; he sees the defiant face of a senior returning his look. Ashamed at his own lack of courage he jumps into the thicket with added courage.

Slowly, but surely, the jungle is narrowed, tree after tree is hewn down, thicket after thicket is removed. More jungle is cut and more thickets are mown down. The standing jungle is now small, but there is no sign of any tiger. Again more jungle and thickets go down, the unfelled jungle is very small now, but still that earth-trembling roar expected at any moment is not coming, and already grumblings have started among some ranks of the hunters that there is no tiger and that what they are doing is futile.

Suddenly, without warning, the tiger roars. This is replied with thunderous roars and wild yelling from the hunters. The hidden excitement is aroused and the hunters now advance forward, mowing down trees, shrubs and bushes—everything that is in their way. The tiger retreats low down, unknowingly towards the open mouth of the stockade, and seeing the wall of the stockade it takes no time to realise that its escape is blocked. Furious, the tiger charges straight for the hunters. A dozen spear flashes towards it and amid thunderous roars from the hunters, the tiger retreats down. The tiger tries to break through the stockade but the thrusting spears from the aged stationed at the point, prevent it. The tiger now realises that it is surrounded and turns its furious head round and round to see some weak point among the ranks of the hunters. Its fury builds up, then roaring and charging, it rushes up against the hunters. Anticipating the attack, the hunter plants his shield at a minus angle and waits for the tiger to strike. As the tiger jumps at the shield, a quick spear is thrust into its body: simultaneously the hunter releases his shield and kicks it downward and amid triumphant yellings, the tiger rolls down the ravine heel over head. The tiger now takes a defensive position. The hunters now yell wild without stop. Several flashing spears from marksman find their home; the tiger pulls them out and bites them with naked fury. Then, Look! that man from that clan throws down his shield and spear into the ground, and with only daoh in hand he rushes down and confronts the enemy. Everybody is looking intensely, nobody is throwing spears. The tiger pounces at him, but pierced by many life-sapping spears the tiger is slow, the man dodges the charge and in the movement, sends his long-handled, razor-sharp 'daoh' swooping into the spine of the tiger. The tiger collapses and more effective blows follow.

The victorious hunters then carry the animal, and 'crucify' it on a wooden structure outside the village gate, by the village path, where for weeks before the natural processes of decay receive its flesh into its secret oblivion, it will receive the curse of village women going and coming from their fields: (spitting)

Tw.....i, you lifted my cow,

Tw.....i, you bit my pig,

Tw.....i, you mother of thieves,

Tw.....i, let thee die premature death though already dead !

But this animal with a big heart does not always meet such a dishonorable death. There are times when the tiger breaks through the ranks of the hunters, in which case the story is different. Then it is the family or the clan from whose area the tiger has escaped that suffers the uncomfortable comments from the neighbouring villagers.

A Trip to the Wild Life Preserve At Dholpur in 1935

By

MAHENDRA PRAKASH

Conservator of Forests, Rajasthan (Jaipur)

We went for a drive with H.H. Maharaja Udaibhan Singh of Dholpur, in his convertible Opel to his 'Van Vihar' and 'Ram Sagar' forest preserves. The back seat and leg room of his car had been filled with vegetables of all sorts (carrots, cucumber, cabbages, etc.) and other foods like millets, gram, cooked sweet—balls made of wheat flour (pooas), rolled and fried sweet bread (mal-pooa). The back seat of the car is known as the Kakri Asan (the "throne of cucumbers") and the A.D.C., Shri Hari Singh, and others, sat there on the top to hand over the food as and when required during the drive.

The Maharaja drove himself and on his left in the front seat sat his guest, a European lady, the Viceroy or some other visiting dignitary.

Soon after leaving the Kesar Bagh Palace, we entered the forest and came across a few 'Sambar.' There was 'Soondi' (the nosey one), who thrust his nose into the car. After him came 'Gareeb Das' (the poor one), who was docile and simple. Both had shed their horns.

There was the third fellow named 'Japan', who with his horns, menaced others (like what Japan was, perhaps, doing in those days).

We saw 'Baiji', the fox. The car is stopped, the door opened by H.H., and 'Baiji' put her feet on the lap of H.H. and drank 'frigcold' milk from a cup and retraced her steps.

There was the 'Sipahi' (soldier), standing to attention. The car stopped near him and he took a round of the car cautiously, his steps falling like a soldier's (more like goose-stepping). He was offered a cucumber by H.H., and he took it obligingly. Then came the 'Bhukkar' (the hungry one), a female sambar who with her voracious appetite was always hungry. Once she caught hold of the diamond cuff-links of the shirt of the Maharaja and ate them up along with the cucumber. The Maharaja was sorry not at losing his precious cuff-links, but was more worried about the 'Bhukkar'. She might have died of diamond-poisoning!

Then came the dainty 'Chameli' (Jasmine) who was likewise offered a cucumber and 'gram chapaties' (they don't like wheat chapatis). There in the distance stood the 'Vakeel' (the Advocate). He was so named because he never believed anyone, not even the Maharaja. All other Sambars ate cucumber from His High Highness's hand, but this fellow would not. The reason was not far to find. He had a boil on his neck. He felt uneasy and blamed all the world for his pain, so cucumber and cabbages had to be thrown to him. In a few days, the boil burst open and the 'Vakeel' was relieved of his pain. After this, we were told he also started eating from the car, like the others.

Sambar are very intelligent and affectionate animals and unlike the Blue Bull can be tamed.

Appropriate names for all animals--

The Maharaja had given appropriate names to each animal depending on its gait, individual characteristics of face, head, ear, nose, horns or some marks on the body and its mannerisms. According to him, each animal, even a bird, is an individual. It has its own personality, character and habits. All these differ greatly between each member of the same species.

The jack couple:—

We soon entered the jurisdiction of the Jackal Couple, 'Rao and Rayin.' Madam Jackal showed up cautiously from the protective cover of a bush. Meat was not offered to them, but 'pooas' (fried sweet balls made of flour), which they liked very much. One jackal was known as 'Cricketeer' because he used to catch the 'pooas' clean like an expert fielder.

The sweet-bread (maal-pooa) was rolled and then fed to 'Rao and Rayin'. H.H. held it in his hand and fed them like pet dogs. There was another jackal known as 'Thakur Saheb' who was also offered the sweet-bread likewise.

"Pooa" are used when thrown like a ball and 'Mal-Pooa' when rolled up and fed with the hands. Wolves also like these sweet-pooas.

Foxes and jackals are intelligent animals and to some extent can learn many things like dogs.

Rao and Rayin (the jackal couple) got a son and then a daughter named 'Bacchi' (the baby). The couple brought their children with them to make friends with their benefactor, the Maharaja and his party.

'Bacchi' grew up and soon courted 'Ulloo Nath Singh' and they were married soon after.

Panther on the road—

We looked, and there was a panther on the road (it was dusk). A rare sight indeed, this cunning and sly creature. We did not believe our eyes, and felt it was an optical illusion in the twilight. We rubbed our eyes. Sure enough, the panther was there. It cast a non-suspecting and satisfied look at us and soon disappeared into the bushes. The Secretary, Shri Hari Singh, took a quick shot with his camera.

There is the 'Sat-Naja', a mixture of Seven varieties of grains and cereals for birds. Millet (Bajra) is for Partridge and other small birds (of which a large variety flocked around the car).

Miss Bonet—the PIE—

There came Miss Bonet. A tree-pie. It always landed on the bonnet of the car and then hopped towards H.H. to feed from his hands. Another one was called 'Jhapto' (The sniper), who snatched food from the hands! Peacocks flocked around, and Pea-hens ate while dancing (a rare phenomenon). When peacocks were being fed, the crows felt jealous and landed on the peacocks' backs to frighten them and to attract the attention of the Maharaja. Crows had also become quite tame.

A squirrel also managed to hop up to the car and got on the shoulder of the Maharaja. Very friendly and affectionate, hopping around, twiching its tail.

It is interesting to see how the birds kept their young ones under discipline. The youngsters dare not venture into eating anything unless mother approved and conveyed to them her

approval after sampling the same herself. The young ones make anxious enquiries all the time.

There was water in the Jhor Wala Nala near Van Vihar. Whenever, due to scarcity of rain, there was shortage of water a tipping-wagon was sunk into the ground to make it look like a pool of water. It was filled with the help of drums brought on small lorries from the Van Vihar lake. Cut pieces of Cucumber, Carrots, and cabbages are kept near the water on lotus leaves to serve as plates. We sat quietly near there to see the blue-bulls coming to drink, followed by Sambars. Tigers also came there to drink.

Tiger & the Cheese—

We soon drove to Ramsagar, another game-preserve some 12 miles away from 'Van Vihar'. Here there is beautiful forest surrounding a lake, and we can even go boating and see the wild life on the banks in the evenings.

For the tiger a small buffalo was tied as bait on the bank. Once His Highness put an open tin of cheese near the bait, and he saw from the boat that the tiger was holding the tin in both hands (front paws) licking and relishing it. It soon got cheesed off!

We asked His Highness how he came to think that tigers would like cheese. He told us that once his cooks brought the news that a cat had taken away a big piece of cheese from the pantry. H.H. thought that when the cat, the aunty of the tiger, liked cheese, it also (belonging to the cat family) must likewise, take kindly to the stuff. It was tried. And here we were, the tiger relishing it before our very eyes.

On our way back at night we came across a docile tiger, 'Buggoo Mal'. It wouldn't leave the road. It was a simpleton. A real carefree fellow. We threw a few 'pooas' at him because there was nothing left with us on the return journey. H.H. told him:—'Hullo Old man, I have nothing else to offer'. Mr. 'Buggoo Mal' sniffed at the articles offered to him, looked up and with his eyes, said—'No, Thank you'. We move on, and soon came across another tiger, Mr. Bhola Nath (Mr. 'Innocent') 10 feet 5 inch in length and a graceful creature. He was so very shy that it always came near to the car hiding behind bushes, like 'Rayin' (Madam Jackal).

A Great Shikari—Turned Animal-Lover—

Maharaja Udai Bhan Singh was once a great shikari and a wonderful shot. He always wore a turban except on duck-shoots, when he donned a 'Sola' hat. His advice was that on a duck-shoot one must wear shoes with rubber soles and keep an arecanut (Supari) in one's mouth to prevent getting a 'gun-head', which one is sure to get after continuous firing of the gun.

In 1913, the Maharaja went to England for the first time and became very much anglicised, but soon got an aversion for the artificiality and mechanical life of the west. He took to Indian dress and turned to religion at the age of 20.

He renounced all shooting and changed into a great lover of animals. He made 'Van Vihar' and 'Ram Sagar' Forest areas of Dholpur into Wild Life Preserves. He used to go to these preserves himself in his convertible OPEL to feed the animals. His philosophy was '*What man cannot create, he has no right to destroy.*'

Animals dread human beings more than their own natural enemies, but they loved him when he gave them his love. Killing of another living being is the violation of the Cosmic Law of Life. Man is a spiritual being, blessed with an immortal soul and a free will.

Some individuals are born with an ability to make mental contact (some kind of telepathy) with animals. They can make themselves understood by them. Animals are also aware of such persons having this gift and they exhibit confidence and lose all fear in their presence.

Such was Maharaja Udaibhan Singh of Dholpur, and he came so close to wild life that they literally fed from his hands !

Better Conservation through Research

By

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Almost everything we have around us today has been improved and modernised to make living more pleasant. From the "horse and buggy days" we have progressed to a life of comforts and gadgets. This progress is obviously due to painstaking research in various fields of science. While the other sciences have kept pace with modern trends, the science of wildlife management is still in the pioneer stage of development.

With some hundreds of acres set aside for wildlife conservation in the form of sanctuaries, national parks and zoos, it may appear that responsibilities in this field have been fully discharged. But we must realise that there is a difference between mere conservation and its proper management. Wildlife sanctuaries and parks cannot serve their highest usefulness if

merely established and forgotten. Without proper management they may readily change into something quite different from what was planned.

In our endeavour to conserve our wildlife, one of the most important considerations is the symbiosis between wildlife and forests, the natural home of wildlife. The destruction of forests inevitably leads to destruction of wildlife and, therefore, if we are to protect wildlife we have to protect their habitats, our forests. In the case of birds, it would imply the preservation of their habitats, such as swamps, tanks and lake-shores.

It is considered by many experts that change in habitats has been major cause of rapid reduction in the populations of wildlife and even disappearance of some species. For example, when a forest is destroyed, the deer species move away, as they have no food and protection. The carnivora, which prey on the deer species, then either also move away or turn to domestic cattle for food, bringing them into direct conflict with man who has taken to destroy them. This is the inevitable result of competition between man and his environment.

With the increase in human population, the demand for land for agriculture increases and results in destruction of forests. This leads us to the question of balanced land use. Land which is not fit for agriculture must be kept under forests and it is in such areas that wildlife must be conserved and protected, for they have a very important role to play in maintaining the status of the land. In such areas, it has been found in Africa, that game farming is an economic and profitable proposition.

We have not yet been able to bring back our lost animals like the hunting cheetah nor we have been able to do much to protect the Great Indian Bustard. Still the reports are that the Bustard are being hunted every now and then. Killing of even the Assam one-horn Rhinoceros is sometimes reported. The lions in the Gir forests have been protected but our success of their alternate home in Uttar Pradesh, Rajasthan and similar areas still remains to be achieved.

The pressure of human civilisation along with changes in land use have seriously affected wildlife population and habitats. Relations between wildlife and its habitat are dynamic. Conservation in any degree, therefore, can best be accomplished by due attention to dynamic ecology. When long range conservation is the object a thorough going research programme is absolutely essential for success. Wildlife research points the way to diversification of forest use that may yield income based on wildlife production from timbered areas. It takes into consideration, not only the desired species but also their principal plant and animal associates, their habitats, tolerances, diseases, inter-relationships and abundance. It helps to maintain

and continue the environmental conditions when they are favourable and helps to improve them when they are not. It deals with the measurement of wildlife populations, their food habits, their movements, range and other biological phenomena.

Proper conservation requires the coordination of several sciences and use in a single specialised field—the conservation of wildlife by management. The correct approach calls for intensive, systematic and persistent research work on scientifically sound basis. This involves a well planned procedure of (i) collecting data directly bearing on problem, (ii) classification and organisation of data on the basis of similarities, variations, causes and results, (iii) generalisation of results to get principles and theories on tentative plan and (iv) verification of generalisations by controlled experiments. Such fact-finding procedure will explore facts upon which management could be improved.

Techniques or the methods to do a particular job, are the main tools in the hands of technicians and scientists. It is also essential that a correct appraisal of the merits and limitations of the techniques is made by counter checks before they are actually applied in the field. Perfection and testing of techniques open up new horizons in understanding the ways of nature.

Fact-finding must be done on a carefully planned basis. Real facts must come from open minded investigations aimed at discovering truths regardless of what the outcome may be. Not all research problems yield positive results. Negative results are also of some value. It is possible that the negative results, of present day may actually turnout to be positive results when viewed under changed conditons in years to come. Research experiments in medicines, engineering and agriculture have produced many useful facts to justify intensive research programmes in all fields of science.

Although the research programme in the field of wildlife management cannot be very ambitious at present, a modest beginning could easily and certainly be made because a large number of research problems concerning the life history of animals can be investigated with minimum of special equipment and facilities. It will be wise and proper at present, to concentrate first on the basic research problems rather than go into far more complicated ones. The three main purposes of the initial investigations should be

- (1) to collect, process and interpret research data with a view to find out the living phenomena and behaviour of animal life and thereby to contribute towards a better understanding of the life processes of the wild fauna of India;
- (2) to critically evaluate the present wildlife management techniques on the basis of research findings and

- (3) to attempt to improve and modify the present wildlife management techniques from the results of research in field as well as laboratory to obtain a maximum return from the resources.

Typical basic research problems that could be taken up initially are as follows: —

- (i) Age, sexual and seasonal variation of skin and plumage as evidenced in the preserved specimen or by live individuals in captivity;
- (ii) Food: preferences, requirements, etc., in captivity and in wild;
- (iii) Hibernation: hibernation and estivation studies in captivity and in wild;
- (iv) Growth rates, fetal development studies, rates of natality and mortality, post natal growth rates, etc.;
- (v) Reproduction: physiology of reproduction, reproductive pattern analysis, reproductive cycles, etc.;
- (vi) Census studies: measures of animal populations in wild in all forest types of India.

The zoos can render very useful service towards the protection of wildlife and also its proper preservation by undertaking studies related to feeding, nutrition, reproductive biology animal behaviour and autopsy studies.

Even though the general type of food taken by an animal in wild may be known, expediency may demand that substitutes be made in captivity; and exact nutritional requirements must be determined. According to recent studies on wild and captive animals, dietary requirements vary with the physiological activities of the animal such as moulting or breeding.

Breeding biology of animals is another field of study which could be undertaken by zoos. This phase of biological research has a far reaching impact which extends into poultry and wildlife management. Animals such as Gorilla and Okapi are now successfully breeding and rearing in captivity. Such an accomplishment was certainly beyond the wildest dreams even twenty-five years ago.

Animal behaviour studies is another field of importance which could be taken up by zoos. Since most animals are extremely secretive in their native haunts, a zoo is an ideal place to study the behaviour pattern of wild animals.

The field of wildlife research in its broad definition impinges upon so many fields that its scope is difficult, if not impossible, to define accurately. It rests most firmly upon the

various facts of biology and also has to have firm footings anchored on other fields of natural sciences. Occasionally, individual wildlife research projects may be concerned rather intimately with one field and relate only incidentally to kindred subjects. The secretive nature of most wild animals makes direct and uninhabited observations in the field, a task often dependent upon fortuitous circumstances rather than upon any plan of the wildlife work. Laboratory investigations of wild animals are almost always handicapped by the possibility that animals in their confinement may not react in the same manner as they do in nature.

The difficulties mentioned above should serve to accentuate the need for careful planning and equally careful collection of data on the part of wildlife investigator. Detailed planning including a critical scrutiny of all the techniques to be employed, is necessary to ensure that insuperable problems inherent in wildlife investigations are not encountered in the proposed investigation. In other words, the scope of wildlife investigation is so broad that this factor itself often proves to be a major stumbling block in planning and executing really scientific wildlife investigations.

But scientific approach is in fact the only way to obtain correct interpretation of living phenomena in nature and which ultimately provides the fabric of science of wildlife management.

Wildlife has been an integral aspect of India for eons of time, but the understanding of the possibilities of wildlife management is in its infancy. Research must determine the niche structure of larger animals and must make assessments of energy flux in our ecosystems. Wildlife conservation and the scientific interest of the wonderful Indian fauna and flora can only be secured by a wider appreciation, interest, awareness and enthusiasm expressed on a larger scale than at present.

Sariska: A Lonely Sanctuary

By

MAJOR A. DAVID

A hundred-and-twenty-five miles from Delhi on the main Highway to Jaipur lies this beautiful, but little-known Sanctuary. 132 sq. miles of scrub-forest cradled in the lap of Aravalli ranges, it was the shooting preserve of the late Maharaja of Alwar, when I first visited it in 1934. Wild life was overflowing it then, and we spotted 4 tigers at 4 P.M. A visit last February was not so rewarding. The reason is mismanagement and wanton poaching. The way it is deteriorating and the stepmotherly treatment it is receiving from the authorities, soon will make it a sanctuary only in name.

The fabulous hunting lodge of the late Maharaja is neglected and almost in ruins. The Tourist department can turn it into a tourist attraction. Domestic cattle roam and graze freely inside the sanctuary which not only deprives the herbivora of its natural fodder, but is also a serious source of infection. This in itself will disturb the balance of nature in course of time. Besides, the inhabitants of the villages inside the sanctuary take toll of the wild animals. This cannot be stopped as long as they are permitted to live inside, in spite of all the supervision. The late Maharaja removed all the villages from inside the preserve and dealt summarily with any kind of poaching or vandalism. That put a stop to all unsporting activities.

Sariska has all the necessary requirements of a sanctuary. It has a perennial river flowing through its heart; high rocky mountains with caves where tigers and other large carnivora can safely and ideally breed, and thick, almost impenetrable, scrubby jungles with grassy undergrowth for herbivora to live and feed. A 6-mile tar-road, also built by the late Maharaja, runs through the heart of the sanctuary up to the famous Hanuman temple. The sanctuary is approachable both from Delhi and Jaipur and there are two reasonably comfortable rest houses where one can put up for the night. The forest department has a jeep fitted with searchlight for night-spotlighting, which can be engaged on prior notice. They also tie live baits twice a week near the late Maharaja's shooting-tower, where flash-light photography is possible.

I feel it is about time that this sanctuary was raised to a National Park. A little more publicity would attract a large number of tourists, as being on the way to Jaipur and having such easy approaches, they can spend a delightful night there, watching the wild animals in their natural habitat.

During my last visit to Sariska, we made two trips through the sanctuary, one early in the evening and the second late at night. We saw quite a few sambar, blue bull, cheetal, some four-horned-deer and pig, plenty of jungle cats and a solitary caracal. The knowledgeable Range Officer informed us that there are about eighteen tigers and 6 leopards left in the sanctuary and that a family of 4 tigers regularly kills the live bait. It did that night, but we could not witness it. The entrance to the sanctuary is free but a nominal fee could be charged which could help in its maintenance.

Game Birds Farming—Part I

By

K.L. MEHTA

Wild Life Warden, Himachal Pradesh, Simla-1.

Introduction

We are all aware of the prodigal waste of the country's wealth of Wild Life and the part that many of our modern technical developments have played in depleting game in its natural habitats. On the other hand almost universal adoption of laws prohibiting or greatly restricting the sale and transportation of wild game has brought about a state of affairs in which one might reasonably expect a wide spread extension of efforts at breeding game in captivity. Thus the efforts may be made by the Wild Life Conservation Departments in each State of the country to establish game species farms or ranches for raising game birds with the following objectives:—

- (a) For restocking depleted forests or over hunted areas or when weather conditions have depleted native wild stock,
- (b) For saving rare game species from depletion or extinction,
- (c) For raising the game for food purposes,
- (d) For raising of ornamental game species for display in our avairies and zoos,
- (e) For use of hobbyists, for field trials and for game birds show purposes,
- (f) To provide research facilities to Zoologists and Biologists to study various phases of the industry.

Apart from Government enterprise the farmers and those individuals who are interested in such farms be also encouraged to establish such farms at a latter stage when the experiment in each State may prove to be successful. A State may buy game birds from private run farms every year for releasing them into the wild. Such farms are duly licensed and approved by the State. The raising and disposal of game birds should be governed by the State Game Laws.

Village Panchayats can also run such Farms and birds are released annually in their village forests, for which hunting licences are issued by such Panchayats. Thus sportsmen can enjoy good shooting and the Panchayats will also replenish their income from this source. By farming and releasing of birds the spirit of controlled shooting in a shooting area will automatically develop among the masses and custodians—who will control such shooting of birds.

Thus the game birds farming will be an interesting and sound business. It appeals to the sport minded individual, the nature lover, and to those looking for a clean cut business of their own, enabling them to live out of doors and be close to nature.

The greatest demand and opportunity for game birds, is the field of high class meat production. Attractively packaged frozen game birds, e.g. Pheasants, Partridges, Chakors, Quails, etc., with delicate flavor, can be sold to Hotels, Clubs and Restaurants if they are sure of steady supply.

Still another opportunity centres around specializing in producing eggs or baby chicks. Breeding strains of Pheasants, Chakors, etc., that will be good producers of eggs and will have the characteristics most desired by the Industry. Thus as game bird farming grows in popularity, this promises to be as specialized a business as turkeys and poultry breeding.

Short History of Farming in other Countries

Ring neck Pheasants (*Pheasianus colchicus*) and Chinese Pheasants (*Pheasianus torquatus*) the birds from Asia Minor are thought to have been introduced into England, long before 1790. Here cross breeding took place among these birds. The first importation of Pheasants into U.S.A. took place more than one and a half century ago by one Mr. Bache and the same were placed on Mr. Bache's New Jersey estate. The experiment failed and in 1887 Mr. Rutherford, brought over a lot of birds from England and placed them on his estate "Tran-quaillity" at Allamuchy, New Jersey. Great discouragement was encountered. But after trials, errors and retrials for twenty three years, Rutherford estates became the nucleus of pheasant breeding in U.S.A. In 1909 the first state Game Farm was established for Pheasants at Sherburee, New York, with a produc-

tion of 1200 pheasants and 6500 eggs. During the last 25 years almost all the States in the U.S.A. have established such farms which bear increasing activities in game breeding and a number of individuals took out licences to establish this industry. In 1928, Philip W. Gauntlett, established first Pheasantry for breeding pheasants in Lincolshire, U.K. and it is many other enterprisers have established pheasantries in England too.

In August, 1960, a Pheasantry was established in Rajniwas, Simla which is first of its kind in the country, by importing two dozens of Ring neck pheasant chick about four weeks old from California, U.S.A. by the undersigned. Under the valuable guidance of Raja Sahib Bhadri, the then Lt.-Governor, Himachal Pradesh, much experience has been gained and now run quite successfully.

Selection of a Site for a Pheasantry Farm

For selection of a suitable site for establishment of a farm the following points should be considered:—

1. An isolated location, a mile or more from any main travelled highway, assures best protection from disease. It should be situated quite a distance from the nearest Poultry Farm.

2. If possible, select a soil of sufficient fertility, in a well drained area preferably hill side, and where vegetation can easily be grown.

3. A plentiful supply of clean water is an extreme necessity.

4. Ample electric power and natural gas or other heat source must be at hand.

Chiggers, poor soil, hot summers and variety of other causes are the limiting factors for raising Pheasants. But Pheasants, Partridges, Chakors and Quails can be raised in any part of the country provided their raising technique are followed properly.

The Pheasants, Chakors and Quails have had the same opportunities to become domesticated as have domestic poultry and turkeys. Even so, none, have ever been successfully domesticated to the extent that they could be unconfined and treated as farm yard poultry. Taking into consideration this habit of the birds they can be raised and released at certain age in the wild for shooting purposes and they easily settle there.

Average egg production per hen per season and percentage of fertile eggs is as under for various game birds

Type of hen	Average egg production	Hatchability of fertile eggs
1. Ringneck pheasants	50-70 eggs	60 to 95%
2. Monal pheasants	9-16 eggs	60 to 95%
3. Kalij and other indigenous pheasants	9-25 eggs	70 to 85%
4. Silver pheasants	60 eggs	60 to 85%
5. Golden pheasants	50 eggs	25 to 50%
6. Chakors	30-50 eggs	90%
7. Quails	55-60 eggs	90%
8. Partridges	30-50 eggs	90%
9. Black Swans	3- 6 eggs	80%

Selection of Birds

Egg production and hatchability are two important factors to be remembered when selecting breeders. Therefore, strong breeding stock should be selected which is good in laying and hatchability. The selection is made when chicks are one day old. As they start to develop you can observe other growth, feathering and stamina. The chicks showing promise can be leg-banded to mark for potential breeders. Birds should be preferred to eggs to make, to start, to gain experience in breeding them.

(To be continued)

TO THE LAST WINGS

By

A.R.H. IMAM

Give me a land of lakes
From thunder's tents withdrawn,
By starry twilit brakes
Where wonder's hours are born !

Give me the long cold wait
When twilight's gold is hush'd,
To lie without a mate
Where straining wings are flush'd,

From winter's unseen haunts
To startle out th' Spring,
And hear the last full chaunts
Of heav'n's last wild wing !

When in the half-lit sky
Their shadows span th' land,
To lie and see them fly
And know I understand :

The last noise as they go,
From grassy wastes unseen,
And just to feel I know
And have been where they have been

Is to smile between the tears,
And bid those wings goodbye,
And wait for them through years,
And hours, like wings, that fly !

The Tiger and Its Prey

By

GEORGE B. SCHALLER

Modern man tends to look at wolves, lions, tigers, and other large predators with a deep-seated antipathy and intolerance. In part, this may be the result of descriptions such as the following one by Theodore Roosevelt of a puma cornered by hunters: "the big horse-killing cat, the destroyer of deer, the lord of stealthy murder, facing his doom with a heart both craven and cruel." In this one sentence he not only denounced the supposed character of predators and emphasized the fact that they occasionally cause economic losses by killing livestock, but he also intimated that they are detrimental to deer and other wildlife populations in which man has a vested interest.

Although it can logically be assumed that the large predators exert an influence on prey populations, studies to determine the extent of that influence have rarely been made. Do they kill animals of all ages indiscriminately? What percentage of the prey population do they remove each year? How often do they kill, and what is the size of their daily food intake? These and many other questions must be answered before the effects of predation can be assessed.

During 1964 I studied the tiger and its prey in Kanha National Park, a small nature reserve in the highlands of central India. In the past few years the increase in the number of tigers in the park, coupled with a decrease in the number of deer, led some of the forest rangers there to the conclusion that the cats were responsible, and a reduction in their number was contemplated. One of my tasks was to find out if a predator control program was justified.

My study area was a broad valley in the center of the park—some twenty square miles of forest broken by meadows of varying sizes and surrounded by a low range of hills on three sides. The forest in the hills was stunted, and the trees were mostly deciduous, dropping their leaves during the hot months of the year. In the lowlands, on the other hand, the forests consisted primarily of tall sal trees, whose larger, ovate leaves provided shade at all times. Working conditions in the valley were in many ways ideal. In contrast to most other Indian forests, disturbance by man and livestock was relatively slight. Wildlife was abundant, and much of it was concentrated there, particularly during the hot season from March to June when the available water consisted of a few pools and temperatures in the shade were 110°F.

The tigers in Kanha Park had their choice of a wide variety of wild prey animals. The most abundant of these was the chital, or axis deer, a lovely animal about the size of a white-tailed deer, with a spotted coat. Some six hundred chital resided in the study area, preferring the edge of the forest, where at dusk and dawn they appeared in herds numbering anywhere from four or five to more than one hundred.

A second species of deer was the stately barasingha, a close relative of the European red deer. In 1964 only about eighty barasingha still survived in the park. Their large size, sociable habits, and predilection for grasslands on which to court, feed, and rest make them such an easy target for the poacher's gun that the species has almost been exterminated in India.

The largest, as well as the most elusive, deer was the sambar. Although some fifty to sixty of these wapiti-sized animals resided in the area, I did not see them often, because the small herds—rarely comprising more than four individuals—retreated into dense forest during the day.

The gaur, a form of wild cattle, were represented by about 125 to 150 animals. These impressive bovids—the bulls reach a shoulder height of 6 feet and a weight of 2,000 pounds—are, like the sambar, primarily nocturnal. Herds, numbering five to twenty individuals each, commonly graze on the meadows until dawn and then withdraw into the bamboo thickets on the slopes of the hills. Wild prey of minor importance include langur monkeys, the small barking deer, pigs, porcupines, and a few other species.

The most abundant hoofed animals in India, and also the tigers' most important source of food throughout the country, are the domestic cattle and buffalo, millions of which roam the forests unattended. Fortunately, only about sixty of them were in my study area, in contrast to the edge of the park, where over 2,500 grazed.

The easiest means of determining which of these potential prey animals the tiger eats, and the extent to which it does so, is to examine its feces, or droppings. In eating an animal the tiger devours the skin and hair, bone splinters, and sometimes hoofs and teeth, all of which can be used to identify the victim. I collected and examined 335 droppings (*table 1, page 56*). In over half of them the remains of chital deer were found, followed by sambar, barasingha, gaur, and domestic livestock, in that order. These animals formed the great bulk of the tiger's diet.

The late Paul Errington generalized that "the large-sized wild ungulates (hoofed animals) suffer from subhuman predation chiefly when immature, aged, crippled, starved, sick, or isolated from their fellows." Studies on wolves in North America have tended to support this

contention. Adolph Murie, for example, found that the wolves of Mount McKinley National Park, Alaska, killed mainly the young, old, and diseased Dall sheep, leaving the most vigorous adults to propagate; L. Mech came to a similar conclusion after observing the interactions between wolves and moose on Isle Royale, in Lake Superior, Michigan. Wolves hunt largely by running down their prey, whereas the tiger stalks its victim, before attacking with a final short rush.

Table 1

Frequency of occurrence of food items in 335 tiger feces collected in the study area, Kanha Park in Calendar year 1964.

Food item	Frequency of occurrence		Food item	Frequency of occurrence	
	No. of feces	%		No. of feces	%
Chital	175	52.2	Grass	8	2.3
Sambar	35	10.4	Domestic buffalo	6	1.7
Barasingha	29	8.6	Pig	3	.8
Gaur	28	8.3	Frog	1	.3
Langur Monkey	21	6.2	Eggshell	1	.3
Domestic Cattle	20	5.9	Termite	1	.3
Soil	13	3.8	Fruit	1	.3
Porcupine	9	2.6			

I depended a good deal on teeth to determine the ages of the animals killed by tigers. Premolar and molar teeth erupt in a definite sequence when the animals are young, and wear down over the years. A relative age can be assigned to animals killed by predators on the basis of tooth eruption and wear. I established nine age classes, ranging from class I, young less than one year old whose second and third molar teeth had not yet erupted, to class IX, old animals with the cheek teeth worn close to, or down to the gumline. However, predators usually consume the soft, weak bones of young animals (those in class I) so completely that they are rarely found. This tends to bias the results considerably. But the death rate can be

computed in another way: the loss in class I equals the difference between the total number of young born and the number surviving to enter class II. This calculation showed that about 50 per cent of chital, sambar, and gaur young failed to reach one year of age—a greater proportion of these animals died while young than at any other time. The barasingha had very few off-spring—only six were counted—but this was probably due mainly to brucellosis, a bacterial infection causing spontaneous abortion of the fetus, rather than to predation.

Table 2

Number of predator kills in each age class of 3 species of deer (excluding fawns in class I).

Age class	Chital		Barasingha		Sambar	
	No.	%	No.	%	No.	%
II	10	11.0	3	9.0	1	2.0
III	8	8.5	4	11.5	7	13.0
IV	7	7.5	7	20.0	2	4.0
V	14	15.0	5	14.0	3	6.0
VI	9	9.5	4	11.5	6	11.5
VII	21	22.0	7	20.0	14	26.0
VIII	16	17.0	5	14.0	14	26.0
IX	9	9.5	0	0	6	11.5
Total ...	94	100.0	35	100.0	53	100.0

The death rate of animals one year old and older showed some important differences between species (*table 2*). Chital and sambar of all ages fell prey to tiger, but seemingly the greatest proportion of these were the older, rather than the prime, animals. On the other hand, the predators removed deer of all ages about equally from the small barasingha population. Only a small percentage of deer kills were in the oldest age class (IX), and it is likely that few, if any, of them escape the tigers long enough to die of old age. In contrast, tigers killed adult gaur infrequently. The remains of only eight large gaur were

found, even though the skeletons are far more conspicuous, and thus easier to find, than those of deer. Undoubtedly the large size and formidable horns of the gaur deter the cats except under the most favorable circumstances. (For example, I once watched a tigress stalk a bull gaur, but suddenly she changed her mind and walked away; on another occasion a bull threatened a tigress with his horns before retreating from her slowly without being molested.)

The various sources of information thus led to the conclusion that although tigers culled the less fit animal—mostly the young ones, but also the older ones, except the gaur—from the populations, many in the prime of life were also taken. Some of the latter were females that had lost their agility in late pregnancy, but others had no obvious handicap. None appeared to have been weakened by disease or starvation.

For a meaningful study, it was also necessary to compute the total amount of wildlife killed by predators during the year. To do this, the size of the prey population, the yearly death rate, and the approximate weight of the animals taken must be known. The mortality rate of the young has been mentioned earlier, but not that of the adults. As a general rule, in a stable population the number of deaths among adults roughly equals the number of young animals entering the population as one-year-olds. The adult sambar had an annual death rate of about 13 per cent, and their numbers seemed stable. The chital and gaur increased slightly and had an estimated mortality rate of 20 and 5 per cent, respectively. The barasingha decreased by 33 per cent because too few fawns survived to offset the loss of adults to tigers.

The mortality figures can be converted into the actual number of animals killed and also into their total weight (*table 3 page 59*). The table includes nineteen domestic cattle and buffalo, which the tigers are known to have eaten in the study area. Thus the predators, including tigers, an occasional leopard, and some poachers, removed an estimated 50,625 pounds of animals from the study area during 1964. Such food items as monkeys and pigs provided an additional few hundred pounds at most.

Now, the most accurate means of determining the amount of food required by tigers during a year would be to follow them for days and weeks. This is hardly feasible, for tigers usually hunt alone at night and are very shy, keeping mostly to dense thickets and ravines. Their nightly meanderings in search of a victim may take them for 15 or more miles within an area of at least 25 square miles. One night a tigress with four cubs killed a chital buck. The family caught nothing further the following night, but on the third night the tigress attacked a buffalo that had strayed from a village. She and her cubs consumed this animal in two nights. They had killed twice in four days. But I was rarely able to make such observations, and had to rely on indirect means to derive a food consumption figure.

Table 3

Estimated number and weight of main prey species taken by predators in Calendar year 1964.

		Young		Yearling and Adult		Total weight in pounds
		Estimated no. taken by predators	Total estimated weight in pounds	Estimated no. taken by predators	Total estimated weight in pounds	
Chital	...	115	5,750	85	10,625	16,375
Barasingha		0	0	27	9,450	9,450
Sambar	...	15	1,500	6	2,400	3,900
Gaur	...	25	5,000	7	9,100	14,100
Domestic Cattle	...	3	450	11	3,850	4,300
Domestic Buffalo	...	0	0	5	2,500	2,500
Totals	...		12,700		37,925	50,625

It is clear that a tiger can eat a prodigious amount during the course of a night, as the weights of freshly killed animals before and after a meal showed. For example, in one night two tigresses devoured 89 pounds of meat—about 44½ pounds each—from a cow. In a similar situation, a tigress with four small cubs ate 85 pounds from a gaur. Although an adult tiger, weighing 250 to 400 pounds, can consume 40 to 60 pounds of meat at a time, this gives little indication of the cat's need on a long-term basis. The tiger is adapted to a feast or famine regime—several days sometimes pass without it being able to secure food. Although the animal has a seemingly unbeatable array of weapons with which to capture its prey—acute senses, tremendous strength, and formidable claws and teeth—the wild hoofed animals also have their defenses, particularly a good sense of smell and great speed. As a result, the tiger must work hard for its meals, roaming many miles nightly and making numerous unsuccessful attempts before finally surprising a potential meal.

A typical hunt went as follows: at dusk (5:57 p.m.), a male tiger strode out of the forest and ambled over a stretch of meadow into a tree-fringed ravine. A langur monkey barked in alarm on seeing him. The tiger advanced about 300 feet up the ravine, entered a

patch of forest, and moved to the edge of a piece of grassland on which about 60 chital and barasingha grazed. From 6:12 to 6:20 p.m. he stalked up a shallow ravine that wound partly across the meadow, attempting to get close to the deer. Suddenly a chital barked and so did a barasingha; both had sensed the hidden tiger. Another barasingha barked back hoarsely, and the whole herd fled. They stopped abruptly, then stood and watched the cat as it emerged from the ravine 150 feet away, secure from attack at that distance. The tiger emitted several muffled roars, as the cats often do after an unsuccessful stalk, and departed.

Tigers in zoos are kept in good condition on about 8 to 12 pounds of meat per day. In the wild, where they are more active, 12 to 15 pounds of meat per day are probably sufficient. At this rate of consumption a tiger needs 4,380 to 5,475 pounds of meat per year. However, parts of each animal are inedible, mainly the stomach contents and most of the bones. These comprise about 30 per cent of the total weight of a deer or other large prey. If the tiger consumes some 70 per cent of the total weight of its victim, it must kill about 6,257 to 7,821 pounds of prey per year to sustain itself. This amount represents a minimum and presumes that the tiger devours all edible parts of the carcass. Unless disturbed by man, this is usually the case, for the tiger camps, so to speak, by the remains--for days if necessary--until the last rotten scrap of meat has been eaten.

The patterns of black stripes on the faces of the cats, particularly those directly above each eye, are so distinctive that it was possible for me to recognize every tiger in the study area individually. A male tiger and a tigress resided there permanently. Two other tigresses used the area sporadically, as did at least seven transients--wandering adult tigers that stayed a few days to a few weeks and then disappeared. The amount of prey killed by these nine transient animals was probably equal to that taken by 2 to 2½ resident adults.

There were also five cubs, four belonging to one tigress and one to another, each of which probably needed about half as much meat as an adult. Thus the area supported the equivalent of 6½ to 7 adult tigers, which required a total of 40,670 to 54,747 pounds of prey during the year. The food requirement of these tigers was roughly similar to the 50,625 pounds computed as the total mortality of the main prey species. Illegal killing of wildlife by the local peoples also accounted for a few pounds.

What, then, was the actual effect of the predation on the wildlife populations? All evidence indicates that the tiger was the main factor limiting the growth of the deer and gaur populations during 1964, and that my small study area contained almost as many tigers as the prey could support. But in spite of the heavy predator pressure, all species except the barasingha remained stable or increased slightly in number. If extensive hunting by

man had been added to the existing natural predation that year, the prey would have been unable to maintain its numbers. Judging by the frequency with which I found old snares and other signs of poaching, the villagers did a great deal of hunting in the park in 1963 and earlier. This poaching, plus the killing by tigers, was undoubtedly the cause for the general decline of the deer. Interestingly, gaur are not regularly poached, primarily because of their resemblance to sacred cows, and they have been increasing steadily in recent years in spite of the numerous tigers in the vicinity.

The tigers in the area subsisted for the most part on wildlife, although they also took some 6,800 pounds of livestock. In other parts of the park, where deer were scarce, the cats fed almost wholly on cattle and buffalo. Without the easily available livestock as prey, the one tigress with four cubs in the study area might not have been able to secure enough food during the 1½ to 2 years that it takes to raise a young from birth until it is large enough to hunt consistently on its own. Tigresses are rarely accompanied by more than two cubs. The others apparently die from starvation and possibly disease or other causes. Thus the livestock is an important buffer that maintains the tigers at an artificially high level—a level the wildlife alone could not support. The sudden removal of all livestock would for a time raise the predator pressure on the wildlife, possibly preventing its increase. It might also cause a movement of tigers out of the area.

Another important concept needs consideration. Errington stated that “regardless of the countless individuals or the large percentage of populations that may annually be killed by predators, predation looks ineffective as a limiting factor to the extent that intraspecific self-limiting mechanisms basically determine population levels maintained by the prey.” That is, populations of hoofed animals will tend to increase in size *in spite of* predation, if they are large and healthy, until their ultimate level is determined by such factors as disease and availability of food. Individuals that fail to die from one cause will merely succumb to another.

The tiger population may also be self-limiting. Intolerance between tigers that meet on the trail or share a kill, as they occasionally do, possibly spaces out individuals regardless of the abundance of prey. When, for instance, almost all wildlife at Kanha was concentrated into a few square miles near the waterholes during the hot season, the number of tigers in the area did not increase. It is likely, too, that when a predator population passes its optimum level, reproduction declines or stops, as may have been the case with the wolves on Isle Royale. Females may abandon their young, and they may have smaller litters than usual, as has been reported in the lion. These are all means of population control.

The interrelationship between a predator and its prey is exceedingly complex, and a brief study can do little more than hint at answers. Wildlife populations are never static. Not only are there natural dynamic changes in the populations, but such factors as poaching by man and grazing by livestock contribute to the instability. Conditions in Kanha Park may well have changed drastically since 1964, and my conclusions from there may not be applicable to other areas. But studies such as these refute the popular formula of predation that can be written somewhat facetiously as $\text{Tiger} + \text{Deer} = \text{Tiger}$. This oversimplification can be replaced with the concept that the large predators in themselves rarely, if ever, have a long-lasting, serious effect on a healthy prey population.

'BAIGA'.....The Tribe of the Tiger

By

HARI DANG

The fields of Madhya Pradesh are sere once again and winter-forests of sal crackle in the drought; the gond and the baiga, the kond and the chirwa, the people of the forests and hills, pray for rain in vain.

But 'Bagh-esur', the baiga-god, the tiger-god, still reigns supreme over his chosen people. And tigers roam the crisp forests, resting in the still-moist shade of ravines along the rivers like the Johilla and the Sone. Cattle are plentiful, and the baiga worship the cattle-lifting tiger. Doon School masters, traditionally, do not !

Ravi Vira, Collector, Shahdol, joined us in the 'saloon' parked on a siding in the Johilla forest, and the baiga-shikari, Sudhu, slipped like the shadows, bringing news of tigers everywhere. There was a pair on the Tikhna nala, another had taken a 'cow' in the Nagara-khol plateau, a family of three had escaped a 'Stephanian'-shikari from Calcutta, and now awaited the 'sahib's' hunt:

We sipped juices in the shade of a 'tendu' tree, when Sudhu-baiga brought news of a fresh 'kill' on the Tikhna nala. A long walk around the 'kill' showed tiger-pugs along the cool nalas which join the Tikhna which joins the Johilla which joins the Sone which meets the Ganga. Sudhu wanted a 'sacrifice' before he would help to hunt his 'Bagh-esur', his tiger-god, the emblem and yet the enemy, the Protector, and yet the bane, of his cattle-grazing tribe, now reduced to grubbing for roots and seeds and grasses in their native forests, as the rice-crop lay in ruins and the gram and wheat withered in the drought. It had always been

so. The forest looked after its people when the rains failed. But now the forests are failing, one-third of what they were a generation ago. That is why there is no rain, and the baigas starve and grovel for the ration-grain which comes from across the Atlantic. What will happen ten years hence, when there is even less forest? There will be no baigas left by then. So, the 'gunia', the medicine-man, the witch-doctor, had said, when they went to him last. Now the baiga consult an M.B.B.S., sarkari-doctor-sahib.

The Collector-sahib, the mai-baap of Shahdol district? He can only try, and looked visibly depressed at the suffering baigas' plight.

I stood on the far-bank of a tributary nala, and the fifty baigas began the beat. Would the 'Bagh-esur' come? Had the sacrifice forgiven Sudhu his sin in beating the tiger? In revealing his line of retreat when beaten, that shady, bamboo-thicket nala? Sudhu felt he was forgiven. I waited alone, the trusty. 470 DBBL heavy in the elbow. The leaves would tell of the tiger's approach, as would the tree pies and the langur in the trees above. Ten minutes, and arms ached Twenty, and the feet hurt, as anticipation bred the cathartic of fear, fear riding high on a lively imagination. What if the tiger came silently, from above, behind, beside? What if he came slinking through the thickets of bamboo and was too near? What if the ammunition hung-fire? Fear is the most wholesome of sentiments when controlled by reason and experience. The Awards for Gallantry are not won by fearless people, but those who overcome fear, whether on a mountain, in front of cannon or with tiger. Otherwise the tiger is wasted. A mere trophy dead before its time.

He came, all burning-gold and fawn-copper in the mottled sun, crackling leaves under-foot, whiskers astern, and the mouth and ears working in alert caution. Hundred yards. Not yet! Sixty, and he turned into the thicket. The leaves followed his progress, in a bee-line to the nala in front. He would appear at fifteen yards, before crossing to my side, to avoid the hill beyond. And then he was there, a momentary pause before the spring across the nala, which he never took. The .470 boomed once, sending the bullet true and the echo thundered back. All doubts had vanished, fear was a slinking shadow in the dirty corners of the mind. There was only this warm sympathy with 'Bagh-esur', the tiger-god, whom one wanted to, (did one really?), kill. God, why do we destroy the things we love?

He grunted at the beast, shot-but did not falter. In one liquid movement he was up and away, clambering over the rocky hill behind. I stood across the nala, and sent two more shots into the retreating form, and sat down on a stone, to smoke a baiga cheroot as the tiger fell in the rocks. The god became an animal, and the glod-and-stripes slipped and slithered into a cleft of rock above. There would be time to gloat over the trophy; right then was only a wave of mixed emotion; regret and fulfilment; the regret a promise, bound to be broken, never to shoot another again; the fulfilment an abiding adoration of the finest living thing in this our problem-ridden country.

The Himalayan Wild Life Research Project

By

HARI DANG

Originator and Project Executive

There has been little significant or substantial progress since the First Report, and the expedition to NEFA in 1964; the reasons for this stalemate are not hard or far to find: Though all sorts of assistance and aid and grants and other technical and equipment-assistance has been forthcoming to many wild life research projects of often dubious value, there has been absolutely no help offered to the Project on Himalayan Wild Life, after the grant from Tata Trusts which was utilised for the purchase of an Exakta camera.

We still do not dispose of standard photographic equipment, neither cine nor still telephoto lenses, what to speak of zoom combinations. Film is hard to come by, and expensive when available. Without telephoto lenses or film, without spotter 'scopes or even the essential library, it is only too easy for detractors of the work of the Project to 'brown off' all the work already done with all the work that waits upon aid. We are particularly hurt that organisations whose support had been promised to us, have withheld it or just let it pass merely because of individuals in whose sincerity these organisations reposed undue faith, and without whose formal support aid cannot be given.

Originally, the plan was to complete Phase I and Phase II of the Project by 1967. This would have needed equipment and assistance to the tune of fifteen thousand rupees. Since this is not available and all expenses are being borne by the Originator and author, the completion of the Phases I and II, which envisage a film, a book, based on full material on the distribution, status, breeding and life cycles, feeding and migrations and population estimates of all Himalayan wild life, might take another two to four years. Fortunately, none others in the field are too keen to undergo the rigours of Himalayan research, and we hope to complete our efforts in due time to receive however retrospective an acclaim and howsoever belated an acknowledgement of our work. Perhaps, then only will Himalayan wild life receive the attention without which it must soon disappear into the blizzards of war and ignorance.

A wild life map of the Himalayan and associated ranges is now under preparation, and an expedition to Sikkim, and one to Lahul and Spiti, is being launched this summer to photograph animals and to collect data, especially on the Sikkim stag, and on ibex and snow leopard and musk deer.

We hope to publish our first full report in the next issue of 'Cheetal' even without external assistance, but we would be grateful for any help by way of photographic equipment, especially telephoto lenses.

'Murghi' in Dehra Dun and Saharanpur Forest Divisions

By

R.D. SINGH

Though the Forest Department means well when it closes more and more areas for shooting, it often does so on insufficient data or faulty information. The department also frames local rules which are not always in the interests of sport and genuine shikaris, a body of people who are the best friends of the forests and their staff. To use a cliché, a genuine shikari has a greater stake in the preservation of game. He is interested in enjoying the sport, season after season. He knows that unless game is maintained at an optimum level his shoots are going to be increasingly disappointing. However, it is a tragedy that the sportsmen are also the ones whom the Forest Department has treated with suspicion.

In writing on the subject of small game shooting, I must confess that I am less qualified than most other shikaris I know, who have shot in the forests around Dehra Dun for over two decades. But my ten years, and over, of regular 'murghi shooting' are long enough for one to know intimately the areas and the conditions of game stock.

In the fifties, rules were pretty liberal and both the Divisions of Dehra Dun and Saharanpur were teeming with jungle fowl. For Rs. 11/- one could get a permit for either of the Divisions. The social aspect of 'murghi shooting' was fully recognised, for one could then take a guest-gun along for an additional payment of Rs. 11/- in fees. One could shoot for the whole month on this permit. In areas of the Divisions which fell under Big Game Blocks a Small Game permit holder could shoot in the second fortnight, on taking permission from the Block-holder. In fact this never proved a hindrance and one could, with a little correspondence, continue to shoot murghi throughout the month.

The season for murghi lasted from 16th October to 28th February in the Dehra Dun Division and till 31st March in the Saharanpur Division. With the growth in popularity of Dehra Dun town and increase of official class of residents, the demand for these permits rose rapidly. The end of the fifties were, perhaps, the golden years of murghi shooting. Hundreds were shot in every popular shooting area every month. People still longingly remember these years of record bags.

Inevitably, the Forest Department was roused to action and with the changes in shooting rules also coincided with the redrawing of boundaries of the Dehra Dun Forest Division. It was split into East and West looked after by two separate D.F.Os.

The shooting fee for a small game permit was raised to Rs. 25/- while the period for which the permit was issued was reduced to the first fortnight in a month. These changes were overdue but the forest authorities appeared to be bolting stables too late. A simple

measure of 'bag-limits' to protect stock was introduced only in 1963. Only 20 birds per gun were allowed on a permit. This was not strictly enforced and still is not, but it helped to make the sportsmen conscious of the depleting stocks. Finally came the measure of closing more and more areas to shooting. West Dehra Dun was closed to both Small and Big-Game shooting and remains so even to-day, after three years. Thano in Dehra Dun East was also closed, while Ramgarh and Lachiwala were both closed even earlier. This resulted in heavy pressure of shooting in smaller and more popular areas, completely destroying stocks in some. More stringent rules were clamped on shooters in Dehra Dun East, where only one gun per Block was given a permit. This knocked out completely the element of sport from 'murghi shooting'. The only method known to this sport being to have the birds driven towards the guns. It is not worth-while to stand as a lone-gun, unable to cover the beaten area. The cost per shoot; of beaters, shikaris, etc., also becomes prohibitive for a single gun. It was even suggested that the guns would not be allowed to beat for murghis but of course, no one took it seriously and I am glad the issue was never revived.

The 1966-67 season has gone by and the position remains unaltered. It has been made more difficult for the 'shikaris' in the Siwalik Forest Division by closing yet more areas—namely Beribara and Ranipur. An important omission in the rules still is that the interests of the increased clientele have not been recognised. It is difficult to increase the number of permits without denting the stocks further. But the issue of permits could be so evolved that a larger number could share the good fortune of enjoying murghi-shoots. Shooting periods could be further broken down and even daily permits could be introduced. Stricter enforcement of bag limits remains, to my mind, the key to healthy maintenance of game stocks. In fact some game stocks could be better maintained by controlled shooting.

This brings me to my first grouse against the changes. The areas that were closed to shooting have been protected long enough. As it is some of them should never have been closed. I shot in Timli West in December 1963. This was a month before it was closed to shooting. A journey of two miles over a Siwalik hump from Mundiawali Rau reached me to Dhaula Tappar. To my great surprise I flushed hundreds of birds during a day's shoot. Clusters of twenties were driven over my gun in almost every beat. There were plenty of kalij and more pea-fowl in the beats than were good for that area. This area could have given many a gun good shoots for the whole season if a proper check on the bags was kept. However, on insufficient data this area was closed to shooting. From overpopulation, diseases are bound to crop up and the game stock will suffer. When shooting is again opened it is likely that the 'murghi' population may not increase appreciably as a result of too long a period of closure. It would have been better to control stock through shooting and strict enforcement of game laws. If during the season the stocks in a certain Block decreased dangerously then the simple expedient would be to further reduce bag limits during the

season or even to close for a year or two. If this was done Block-wise in Dehra Dun and in Saharanpur more shikaris could have been offered sport and shooting could be continued in all Blocks throughout the season, year after year. This would, of course, require a larger number of guards and wardens to help in management.

I have reliable information from most areas of Dehra Dun where shooting has been closed that there is enough murghi in them. This perhaps has been achieved partly by closing these areas to shooting. But it would not help much to keep them closed for an indefinite period. Periodic closures would serve the purpose better and at the same time would lessen pressures on blocks open to shooting. In other words, no block should remain open or closed to shooting for more than 2 consecutive years. Also, it is faulty game management to treat feathered game on parity with big game. 'Murghi' breed faster than big game. Most areas, now closed for big game could be kept closed but there is no justification in keeping small game shooting closed in the same areas.

A word about murghi stocks would not be out of place. In areas where shooting is heavy, birds seem to get scarcer not because of large bags only. The game crop next season should be improved in quality by healthy breeding. A large number of spring chicken are shot in October and November, because they offer a comparatively easy shot. They are slow on the wing and at times are stupid enough to come and sit on trees in front of the guns. The old cock-birds are wily and swift in flight and consequently more difficult to hit. A large number of these old cock-birds survive for many seasons getting more wily every time. Not all the guns are quite enough for them. These birds are not the best choice for propagation of the stock. In U.K. at the end of the season for pheasant 'cocks-only shoots' are arranged to destroy some old birds. Or a gillie is given the freedom to pot them at leisure on the coverts. This is done to give the young birds a chance to improve the stock. I do not recommend open permits for these birds here, but the Forest Officers could make use of their guests to do service to the forests and fit in their own outings.

Finally, pea-fowl! To us, the symbol of a loving people, the pea-fowl has been made more sacred by having it declared as a National bird. It was definitely an ill-advised step. Not only are these birds destructive to crop but are so even to clutches of Jungle-fowl eggs. Even under extreme pressure from the Forest Department I am skeptical about any revision of this law in the legislature. Certainly not in the year of the Holy-cow. But if the finest sport among feathered game, (Ref: Holdsworth—Cheetal 1958) that of 'murghi' is to be maintained in and around Dehra Dun, then we must make an issue of it. On the other hand, if pea-fowl were opened for shooting, the bags of sportsmen would be the better weight for weight if there were a few pea-fowl in it. Thus lowering the strain on jungle-fowl stock.

[We hear there is a proposal afoot to re-open more of the closed areas of Dehra Dun next season.Ed.]

From the States

Andhra Pradesh

A bison was found inside a 20-foot deep well in Warangal district and taken out to be sent to the Nehru Zoological Park at Hyderabad. Evidently it was trying to get a drink. This report lends veracity to several reports from the drought-affected areas of India that animals are suffering equally with human beings, possibly worse, and that something needs to be done to help them survive the next few months' ordeal.

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Jammu and Kashmir

According to an article in the Bombay Natural History Society JOURNAL, by Mr. E.P. Gee, the Kashmir stag or 'hangul' is not doing too well in its most numerous and accessible colony in the lower and upper Dachigam sanctuaries. Mr. Gee estimates the current population of these areas as 180. This is lower by 70 than the population estimated in 1960, and this in spite of several of Mr. Gee's valuable recommendations in his earlier report having been accepted by the enlightened officials.

The Kashmir stag, kin to the rarer Sikkim stag, of which hardly anything seems to be certain as regards current distribution, is one of the most magnificent trophy deer of India, and its future prospects seem dim, indeed, though we have heard from mountaineers and foresters of the existence of herds of these animals in Chamba and valleys both east and west of Pangi and Kishtwar. These latter reports are unconfirmed so far by first-hand visits by wild life enthusiasts, possibly because more than 'jeeps' and 'bandobast' is required for such ventures into the Himalayan or Pir Panjal interior. Perhaps, a valuable first step towards helping the 'hangul' to flourish would be stricter enforcement of the Dachigam Sanctuary, where instances of 'poaching' are rumoured, though again not confirmed by first-hand visits.

Another of our army correspondents, who must remain anonymous, as he remains even to us unlocated with exactitude, behind his A.P.O. address, reports that he has recently seen a 'markhor' shot by one of his NCOs. We conjecture this to have been in the general area of Kajinag, from where, too, Mr. Gee reports, through Col. Nedou, the existence of a herd of 'markhor' of 11, and of another of 35-40. The 'markhor', of course, is NOT a 'wild sheep' as reported, being one of the TRUE goats of India, *Capra falconeri*, with spital horns and hoof-glands, and the characteristic 'goaty' odour.

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Madhya Pradesh

Wild animals in three districts are being driven by drought conditions to seek water within human habitation, and are falling prey to guns. There are reports that 'cheetal' and 'sambar' have been loitering about pools and ponds in the northern and western districts of Madhya Pradesh.

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Uttar Pradesh:

In the state of Uttar Pradesh there is at present no water fowl sanctuary. Most of the big lakes which are considered suitable as prospective sanctuaries lie outside the reserved forests. Under the existing rules, there is no provision under which areas outside the reserved forests could be declared sanctuaries, with a view, however, to stop wanton killing of both resident and migratory bird population, it was considered essential to stop shooting in some lakes as a step forward towards our ultimate objective. It was, therefore, decided to apply the provisions of section 3 of the Wild Bird and Animal Protection Act, 1912 to at least one lake in each district of the state. So far the following 12 such lakes have been selected and notifications prohibiting shooting of cormorants, darters, moor hens, mallards, teals snipe geese, etc., within radius of 5 kilometers of these lakes have been prohibited:

1. Chinhat Jhil, Distt. Lucknow.
2. Samaspur Jhil, Distt. Rae Bareli.
3. Nawabganj Jhil, Distt. Unnao.
4. Sandi Jhil, Distt. Hardoi.
5. Ramiabehar Jhil, Distt. Kheri.
6. Shahalampur Jhil, Distt. Sitapur.
7. Upardaha Jhil, Distt. Allahabad.
8. Sita Duhor Jhil, Distt. Bahraich.
9. Majhgawan Jhil, Distt. Hamirpur.
10. Kamalasagar Kurencha Jhil, Distt. Jhansi.
11. Sardasagar Jhil, Distt. Pilibhit.
12. Sahsawan Jhil, Distt. Badaun.

The total area of the Corbett National Park was 125 Sq. miles till a few months back. Out of this an area of 19 Sq. miles will go under water when the Ramganga river project is complete. The adjacent shooting blocks of Mandal, Jhirna and Bijrani, were closed to shooting since last year with a view to provide a buffer along the Park. It was, however, considered essential to add suitable adjacent areas to the park both to make up for the area to be submerged as also to do away with legal lacuna that still remained after merely

closing the areas to shooting. With this object in view an area of 58 Sq. miles has been added to the park, raising the total to 183 Sq. miles. The revised boundaries of the park have been passed by both the legislative houses of the state as required under the U.P. National Park Act of 1935.

We have learned from several officials that the U.P. Forest Department have been conducting an 'Elephant Census' to find out the actual number of elephants, the sex-ratio, the age-distribution, etc., with a view to finding out what is the optimum number of wild elephants which the forest areas of this state can support without excessive damage to the habitat. Elephants are wasteful feeders, and destroy plantations and reduce woodland to grassland by knocking down trees to get at the foliage. We shall be very interested to have a report of this 'Census' (though it will probably be more accurate to call it an 'estimate') and also very keen to find out what exactly the Government will do with the excess population, as there is a very much reduced demand for elephants these days. Perhaps, it might become necessary to 'cull' the excess, by issuing sporting permits.

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West Bengal/Sikkim

One of our regular correspondents, an army officer, now posted in the border areas of the Eastern Region, writes without address for security reasons, that there is definite information of scattered pairs or groups of 'shou' or Sikkim stag in his part of the Border. We can only presume that he is either somewhere near the tri-junction of Sikkim, Bhutan and Tibet, north of Kalimpong, or to the west of Bhutan in the NEFA. He suggests that the Society send a team of zoologists to investigate these 'khabbars', and possibly to take photographs of this rare animal.

Correspondence

Sir,

I have read with surprise your editorial comment entitled "Wild Life Transplants and Breeding Stock" (CHEETAL, October 1966, pp 70-71) which is a criticism of my paper CONCERNING THE INTRODUCTION OR RE-INTRODUCTION OF THE INDIAN RHINOCEROS INTO OTHER PARTS OF INDIA in the same issue of CHEETAL. It appears that you have followed some newspapers in mistakenly presuming that floods do damage to Kaziranga and its rhino.

Severe flooding of Kaziranga is an annual occurrence, and has probably been going on for hundreds, possibly thousands, of years. It has become an integral part of the ecological pattern of the area, as has the annual burning-off of grasslands. The wild life, especially the rhino, are accustomed to a flood, and take temporary refuge in the lower parts of the nearby Mikir Hills, and then return to the sanctuary when the flood recedes. Occasionally a baby rhino becomes separated from its mother, but few adults would perish in a flood because, unlike the two African species of rhino, the Indian rhino is a very good swimmer.

In fact floods are now believed to be actually necessary and beneficial to the habitat and therefore to the rhino. For the vegetation there is the type which exists only where annual flooding takes place, and several species of plants there cannot thrive without being waterlogged for a few weeks each year. Moreover, since water hyacinth invaded Kaziranga about thirty years ago, floods have actually become necessary for clearing out the many streams and *bheels* in the sanctuary. If there has been no big flood, the following cold weather sees many streams and *bheels* completely choked with water hyacinth.

That rhino thrive in such an area is proved by the fact that, in spite of continuous poaching, their numbers have increased from an estimated dozen in 1900 to 400 now (according to the latest census). In a discussion with senior Assam Forest Officers last June, I found that they (including the Chief Conservator) agreed that the flooding of Kaziranga, so far from being harmful, was actually beneficial—in fact essential.

Recently Mr. J. J. Spillett, the ecologist from U.S.A., appears quite independently to have come to the same conclusions. In his Report on Kaziranga, he has written: "Annual flooding of the sanctuary by the Brahmaputra River is probably essential for the maintenance of optimum habitat for some species, such as rhino and wild buffalo....Almost all of the sanctuary's streams and *bils* have been invaded during recent years by water hyacinth. Floods are presently the only means by which these water areas are temporarily cleared and

without floods they would shortly become solid green masses of vegetation.....Overall, flooding is probably beneficial, if not essential, for most species of mammals in the sanctuary. Besides temporarily clearing the water areas of water hyacinth, they replenish the water supply in the numerous *bils*, and essentially irrigate the savannah-like grasslands "

Obviously nobody, still less a conservationist, wants to keep "all his eggs in one basket". We are singularly fortunate that besides Kaziranga there are other "baskets" of rhino some distance away, such as Laokhowa which is 44 miles away with 40 rhino, Orang which is 55 miles away with 15-30 rhino, Manas which is 130 miles away with 15 rhino, and Jaldapara which is 275 miles away with 50 rhino—not to speak of Nepal's Chitawan which is 550 miles away with 165 rhino.

If Bihar or Uttar Pradesh (not Kerala, which is far outside the former range of the Indian rhino) could re-introduce rhino into one of their wild life places, no one would be happier than myself. But having spent nearly forty years studying the rhino and its habitat, and fifteen years in consulting leading conservationists in four different continents on the subject of re-introductions, I thought it my duty to publicise the difficulties which stand in the way of re-introducing this particular species. Should any State, however, try it and find it a costly failure, I hope no one will grudge me the right to whisper quietly "I told you so".

E.P. Gee,
Assam.

Madras

Sir,

This refers to your editorial comment, 'Wild Life Transplants and Breeding Stock', at page 70 of Vol. 9, No. 1 of CHEETAL (October 1966).

In making these comments you assume that (1) the rhinoceros population of India is limited to the Kaziranga area, and (2) that yearly flooding is not part of the natural factors that the rhinos here have to face. Neither of these is true.

Rhinoceros unicornis is found outside Kaziranga in the Jaldapara Sanctuary of West Bengal, and in the Manas Sanctuary of Assam, even leaving out Nepal. The question of storing all the eggs in one basket does not, therefore, arise.

When any natural phenomenon, like floods or heavy rains, are of yearly or common occurrence, the correct ecological stand to take is that it is beneficial and perhaps even necessary for the fauna of the area, provided the fauna does not exhibit any notable dwindling

or sickening on that account. The history of the Kaziranga area as a rhino sanctuary shows that while poaching has sometimes reduced the rhino population to dangerously low levels, floods have not. The rhinos here may even benefit by the consequences of periodical flooding.

(We stated that the 'largest pocket of' rhinos was in Kaziranga; the uniqueness of the basket of eggs was, therefore, metaphorically meantEd.)

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Copy of letter dated 1st December, 1966 from Mr. J. Wilson, Hony. Secretary, Nilgiri Wild Life Association, Ootacamund, Nilgiris, to the Editor, Cheetal.

Sir,

Pages 75 and 76 of your October 1966 edition of the Cheetal gives a tourists' guide to National Parks and Sanctuaries. The guide describes 'The Nilgiri Ibex' as one of the wild life attractions in the Mudumalai Sanctuary. I have to state here that the Nilgiri Ibex does not occur in the Mudumalai Sanctuary. The Ibex is an animal which lives in seclusion in the grassy hill tops at elevations above 7,000 feet in the Nilgiris. It does not occur elsewhere in similar situations in South India, like for instance the Anamalais, the High Ranges of Kerala, the Muthikulam and Palamalai Hills in Palghat and in some of the peaks in Tinnevely and Southern Travancore, but nowhere below an elevation of 5,000 feet. The Mudumalai Wild Life Sanctuary is an undulating expanse at an elevation of 2,800 to 3,500 feet above mean sea level and bears deciduous forests in the west and thorn forests to the north and north-east. The Ibex can never occur here. Similarly flamingoes do not occur at Vedanthangal. It is rather unfortunate that a mistake of this kind should creep in a journal published by the Wild Life Preservation Society of India.

Reservation of rest houses in the Mudumalai Sanctuary and elephants for joyride, etc., are all made by the District Forest Officer, Nilgiris Division, Ootacamund and not by the State Wild Life Officer Madras as stated in the Guide.

[The above mistakes may please be corrected at an early date or this letter published in your next issue.

Yours faithfully,

(Sd) J. Wilson,

Honorary Secretary, NWLA.

The mistakes pointed out have been corrected in the Tourist Guide. The information was taken from Indian Board for Wild Life publications—Proceedings of the Third Session held at New Delhi from 14th to 16th February, 1958 (Ministry of Food and Agriculture, Government of India, New Delhi—Page 136—Enclosure 'E' Mudumalai, and information about enquiries from E.P. Gee 'Wild Life of India' Page 178.)

Sir,

I wonder if you are aware of the grave situation in the districts of Bihar which have been severely hit by the drought and ensuing famine conditions? Not only is wild life being freely poached, with the tacit approval of the authorities, but also, animals driven by thirst and the lack of any greenery to seek help near the roads, where too often they fall victim to villagers armed with sticks and stones, if not crop protection guns.

I realise that human life must take precedence over animals, but there should also be some recognition of the needs of animals, which are, in the long run, our own needs, in the planning on famine relief. Water tanks should be provided, especially in Hazaribagh forests, and the defoliation of trees stopped, even at the expense of depriving cattle of feed.

In all, it seems a much more gigantic relief works plan is needed than the present minor relief measures, and only in this greater expanded programme of relief would it be possible to fit in some help for the wild life of Hazaribagh and other districts, where no leaf is to be seen on the trees, and animals roam in the hot sun and search for water in wells and near the roads, to be shot.

S.K.N. Singh,
Hazaribagh, (Bihar)

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Sir,

..... Another thing which the Society should take more active interest in is to attempt to get the Government to prohibit the export of tiger and panther skins. At present, there is an Open General Licence on these items, with the result that they are being exported freely and often by people whose source of supply is poaching and poisoning of kills. How can the Government advocate conservation of wild life, and yet permit such free blanket export of the skins? At the very least, some measure of export-control should be introduced on tiger skins.

Yours etc.
S.P. Sharma, New Delhi.

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Sir,

I have recently purchased a map of India issued by the Tourist Department in many volumes, each priced at 75 paise, covering the whole of India from the point of view of the tourist. The maps are excellent, but I have noticed a glaring omission in that the Corbett National Park is not shown or mentioned in any of the maps covering the U.P. 'terai' area.

I fail to understand what could have caused such a colossal printer's devil? Surely the tourist department officials responsible for this have heard of the Corbett Park, the first National Park in India? Surely they know that thousands of visitors go there each year, and it is a valuable source of tourist revenue, inland and foreign, earning us much foreign exchange? Or do they?

It is very much to be hoped that the omission would rapidly be repaired, and the maps withdrawn from sale till this is done.

S. K. Sangh,
New Delhi.

Students' Corner

The Wild Life Club, Forest Research Institute and Colleges, Dehra Dun, affiliated to the Wild Life Preservation Society of India, Dehra Dun, organised a Wild Life Essay Competition for students for the tenth successive year. The subjects chosen for the competition were:—

1. For Seniors (for Standards IX to XI)

“Place of Wild Life in Indian Culture”

2. For Juniors (for Standards VI to VIII) **“A Shikar Story”**

2. There were 33 entries in English and 30 in Hindi from ten Schools of Dehra Dun District. This showed a spirit of love for Wild Life which is very gratifying to us and we are grateful to all the participating Schools for their active and continued co-operation in the cause for the preservation of Wild Life in India.

3. The names of the Prize Winners in various sections are as under:—

1. English Senior Section

- (a) Shri Bhaskar Venkataramany
of St. Joseph's Academy.
- (b) Km. Venu Sandal
of St. Thomas' High School.

3. Hindi Senior Section

- (a) Shri Vinay Kumar Pandey
of Central School, New Forest.
- (b) Shri Shyam Lal Ganguly
of St. Thomas' High School.

2. English Junior Section

Km. Lalitha Chacko
of St. Thomas' High School.

4. Hindi Junior Section

Shri Shalendra Kumar
of St. Thomas' High School.

4. Two prize winning essays in English are reproduced below.
5. The Society congratulates the winners and thanks the Wild Life Club, Forest Research Institute and Colleges, for organising the competition which will go a long way to help the cause of wild life preservation in the country.

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THE PLACE OF WILD LIFE IN INDIAN CULTURE

BHASKAR VENKATARAMANY

Class X-B

St. Joseph's Academy

Wild Life is one of the most gracious gifts of mother Nature to this ancient country of India. It is rich in variety and in colour and is a many splendoured thing. The majestic lion, the graceful but fearful tiger, the nimble deer with the proverbial beauty of its eyes, the huge elephant, the picturesque peacock, the woodpeckers and pheasants are the things which any country may be proud of. This magnificent asset of ours with its varied fauna occupies a very prominent place in Indian culture.

Our mythology, ancient art and literature all bear ample testimony to the indisputable fact that in the older times wild life occupied a privileged and prominent place in the everyday lives of the people. Our scriptures enjoined a humane and considerate attitude towards these wild beasts. Our religion is full of compassion and human feeling towards these dumb animals. This has been the keynote of our precious Indian heritage.

'Ahinsa Parmo Dharma' has been a cardinal and guiding principle in our lives. It is recorded that when the celebrated author of the epic Ramayana, Valmeeiki, came across a heron pierced at its side by an arrow, he burst into tears of grief and the words which flowed from his mouth came to be known as the first 'slokas' in Sanskrit to be ever heard on this sacred land. In the Purush Sutra, the prayer, 'Shanno Astu Dwapidae san Chatuspadae' is meant to invoke peace to all living beings including birds and animals. In Kautilya's Artha Shastra, there are significant passages which reveal the importance paid by the statesmen of the old days to the problem of wild life preservation. Certain forests were declared to be Abhayaranya (literally meaning forests without fear), in modern parlance, we call them sanctuaries or national parks. Park Superintendents were appointed to look after the upkeep of these beasts and guards were appointed to prevent poaching. Heavy penalties were laid for offenders who entrapped, killed or molested birds and beasts. Animals which became vicious were to be entrapped and killed outside the sanctuary so as not to disturb the

peaceful air of the sanctuary. The exploitation of the forests for major forest products like timber and fuel and minor forest products was totally prohibited in protected forests.

The Hindu religion is replete with its references to wild life. The protection of wild life was enjoined as a sacred duty to all men. In the olden days the Indian rishis (sage) used to live in the forests and their ashrams were the seats of learning where most of our ancient culture was born. In the forests also used to live the animals but not as mere dumb beasts but as beings with feelings and sentiment. They roamed about the ashrams without any fear of the dreaded arrow of the rapacious hunter. Shakuntala's playmates in rishi Kanava's ashram were none other than these dumb beasts, but they understood each other and so enjoyed each other's companionship immensely.

In the scriptures, the position of wild beasts is in no way less than that ascribed to man. In the Ramayana, we hear about the monkey god, Hanuman, the loyal eagle Jatayu and the bear Jamawant all of whom helped Rama in their own ways to defeat Ravana and bring peace and tranquility to the country. The wisdom and courage shown by Hanuman raised him to the position of a super natural being and even now he is worshipped as a God throughout the length and breadth of the country.

The various avatars (incarnations) of Vishnu such as Meena (fish), Kurma (tortoise), Varata (boar), Narasingha (human with lion's-head) all go to show how the people of olden times stretched their imagination to associate the greater Creator of the Universe with the various forms of wild life. Ganesh, the elephant headed God occupies a distinct place in the Hindu pantheon. No one can succeed in any endeavours unless he is placated at the beginning.

The elephant has been described as a favourite of the God Indra and its sanctity has been further enhanced by the belief that it guards the eight celestial points of the compass.

Nandi (the bullock) which guards the doorway to Shiva's sanctum, the Garuda (eagle) of Vishnu, which is the gods vahana (vehicle), Saraswati and her curvaceous swans. These and a host of other citations from the scriptures all go to show how wild life had affected the imaginations of the people. The goddess Durga chose the lion as her charge in her fight against the forces of darkness and evil, and that is why the lion has come to represent the Symbol of Dharma (righteousness). In the days of old the kings used to sit on a seat called the "Singhasana" meaning the seat of the lion. That is how the lions came to adorn the Sarnath lion Capitol of Ashoka. The original consists of four lions standing back to back mounted on an abacus with a frieze of an elephant, a lion, a bull and a horse. A symbol of this is now our national emblem.

Wild animals and birds have justly caught the notice of our poets and artists. Our poets have sung the praise of the melodious tunes of Indian birds. Ancient carvings and paintings on the Ajanta Cave frescoes and the Khujarahho temples show the cave with which animals were held in those days.

The animals too have justly caught the notice of our writers. In the well known Panchatantra and Hitopadesha, there are stories with such characters as lions, bulls, camels, foxes, owls, crows and snakes. These stories are known by every child and are such that.

They draw children from play
And old men from the chimney corner"

as stories of Moors, Othello to his lady love Desdemona.

We all know of Ashoka's fifth pillar edict, in which he states the need for the conservation and preservation of various animals, birds and fishes. Among these were the lion, the elephant, the swan, the cuckoo and the sparrow.

In olden days, wild life was preserved by attaching sanctity and veneration to the various forms of wild life according to the beneficial role they played to human life. But, vicious animals were killed when they were in the habit of endangering human lives and people. Kings and nobles indulged in hunting but they were sportsmen and did not kill for the sake of killing, though they too had their taboo animals.

Thus we see that the wild life of India is intimately bound with its culture and heritage.

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A SHIKAR STORY

LALITHA CHACKO,

Class VIII-B,

St. Thomas' High School.

The word shikar refers to hunting small and big game. In early days, hunting was a necessity. It was not only a means of obtaining food, but provided many of the other necessities of life such as clothing and tools. As civilization advanced, people turned to shikar as a sport primarily indulged in by the aristocracy of Asia and Europe India offers many opportunities for shikar and the sport is popular.

During my stay in Mysore, I was requested to kill a man-eating tiger which was causing much havoc in Shimoga district. The tiger had already killed thirty-five women,

eleven men and many cows and buffaloes. I arrived in Shimoga district accompanied by six men who carried my camp-kit.

On arriving there, I found the villagers numbering some hundred and fifty men, women and children in a state of abject terror. They would not leave their homes after dusk for fear of the tiger.

Apparently the tiger was still in the vicinity for it had been heard calling.

After breakfast I went to the forest area to search for pug-marks. An inspection of the pug-marks showed him as being an average sized animal in the prime of life. All that morning I walked round the village looking for tracks and hoping to meet the tiger.

I was inspecting a pug-mark when I was attracted by a slight movement on a ledge. On looking up, I beheld to my horror no-one but the man-eater! In a flash I raised my gun and put two fingers on the trigger. My prompt action in pointing my rifle upwards had possibly saved my life.

After a few days when I got news of a successful kill some five miles away, I set out for the place at about 9 a.m. I found that the man-eater had been to the kill. There were two large teeth holes on each side of the buffalo's neck and the head was loose on the neck. I covered the kill with leaves and twigs to protect it from vultures. A machan was arranged to be constructed. I got into the machan at 5 p.m.

The approach of the tiger at 7-30 p.m. was well heralded by warnings from wild fowl and monkeys. The tiger had hardly commenced eating when I caught sight of a big bear, which was sniffing the air. As I was a little to the right of the kill, it had not scented me but it had scented the tiger. Waiting until the tiger was eating with great gusto, he cautiously projected his head over the lip of the hole and looked down at the tiger.

Although I have seen bears walk off with tiger's kills when they were not present I had never seen a bear trying to get the kill from a tiger—and a big male one at that.

The tiger saw the bear; then started a fight. The noise that was made by the screaming bear and the roaring tiger was frightening.

I had seen two different animals fighting for the sake of fighting not for the purpose of one using the other as food. I was very excited. In the end the tiger came towards my tree with the bear following. With a .375 Magnum I took aim and shot at the tiger but the shot missed him and hit the bear which fell dead. The tiger disappeared. The bear was bleeding profusely and his nose had been torn in half. When I told the villagers that they could have the bear's fat, they were greatly pleased.

The next day, a villager, Chandu Lal told me that the man-eater had killed a woman who had gone to the forest to cut grass. She lived in another village nine miles away. The men were much too scared to do anything.

When I heard this, I asked Chandu to show me where the incident had occurred. Half reluctantly he came, mumbling something about the tiger being sure to kill him. Every now and then he would stop and pull at my arm or my gun saying that he could hear the tiger. Once he pushed me into a ditch and would have jumped in himself, had I not shouted at him. On being asked why he had done this he said that he was sure that he had seen the man-eater behind a tree. He would not sit down anywhere either.

We followed the pug-marks, the blood trail and the 'dragging-marks' for a mile where I saw the woman's body behind some bushes. I told Chandu to climb up a tree and be very silent.

After about forty-five minutes, I saw the tiger coming towards the kill. Suddenly I saw something which made me gasp. In his fright Chandu Lal had let go the branches he was holding, and before my terrified eyes fell to the ground.

With a roar the tiger went towards him. Desperately I shot wildly to the sides. The tiger was distracted by the shots and spared the man only to come charging at me. I remained calm and let the tiger approach me to the correct range and then fired. I nearly died of fright when, instead of dropping dead as I expected him to, he went up into the air above the bushes for his full length and fell backwards on to a tree. Then he got up and came straight at me. This time I made sure that my bullet would not miss him and, taking careful aim, I pressed the trigger. The bullet hit him on the shoulder and he fell dead with a roar louder than thunder.

When Chandu saw the dead tiger he rushed to my side. The villagers' joy was indescribable. They begged me not to skin him then. So he was taken throughout the village for all the people to see.

When I skinned him, I found that his claws were broken, one of his canine teeth was broken and his front teeth were worn down to the bone. These defects had caused him to become a man-eater.

After all, I had succeeded in killing him. Although I was sorry for killing such a magnificent animal, I was glad to feel that I was the means of saving a few lives.

Library

The following books and publications were added to the Society Library. The Society thanks the donors and requests members to donate more books or money to make the library more useful.

No.	Name of Book	Remarks
86.	The Flowering Trees by M.S. Randhawa	Purchased
87.	The Year of the Gorilla by George B. Schaller	Donated by
88.	Snakes of India by P. J. Deoras	Mr. Hari Dang.
89.	Indian Jungle Lore and the Rifle	Purchased
90.	Bird Shooting The Hard Way by A. David	-do-
91.	Bound Volume of 'Cheetal' - 1958 to 1960	-do-
92.	Bound Volume of 'Cheetal' - 1961 to 1963	—
93.	Tiger Land by C.E. Gouldsbury	Purchased
94.	The Call of the Man-Eater by Kenneth Anderson	Donated by Mr.
		Pratap Singh of
		Gurukula Kangri,
		Hardwar.
95.	The Black Panther of Sivanipalli by Kenneth Anderson	-do-
96.	The Loney Tiger by Hugh Allen	-do-
97.	The Temple Tiger and More Man-Eaters of Kumaon by	
	Jim Corbett	-do-
98.	Adventure in Tigerland by James Inglis	-do-
99.	Animal Ecology by Charles Elton	Purchased.
100.	Birds of the World by Hans Hvass	-do-
101.	Tourist Road Map of India—Northern Region	-do-
102.	Tourist Road Map of India—North-Eastern Region	-do-
103.	Tourist Road Map of India—Eastern Region.	-do-
104.	Tourist Road Map of India—Western Region.	-do-
105.	Tourist Road Map of India—South-Western Region	-do-
106.	Tourist Road Map of India—Central Regin.	-do-
107.	Tourist Road Map of India—Southern Regin.	-do-
108.	The Indian Wild Buffalo in Peninsular India—	
	A Preliminary Survey	Complimentary
109.	Bush Dwellers of Australia	from B.N.H.S. Bombay
		Complimentary from the
		Australian News and
		Information Bureau.
110.	The Fishes (Life Nature Library)	Purchased.

जब बाइसन ने तस्वीर खिचवाई

मई का महीना, चिलचिलाती धूप, लू के झोंके तथा सूखे पत्तों की खरखराहट। बेतला जंगल, पलामू नेशनल पार्क के अन्दर, उस दिन का यही वातावरण था। गर्मी से व्याकुल किसी भाड़ी भुरमुठ के नीचे विश्राम करते वन्य जन्तुओं को मैं देखना चाहता था, तथा उनका चित्र उतारना चाहता था। “तूनाही” नाले में मैं धीरे-धीरे जा रहा था। हैट के नीचे से अबिरल पसीने की धारा चश्मे के ऊपर छितरा जाती और मैं उसे साफ करता जाता। यों पानी का अब तक नामोनिशान न था परन्तु वन-रक्षी पाठक के अनुसार आगे गुलर के पेड़ के नीचे, हथबभवा के पास काफी पानी की उम्मीद थी। नाला बाईं ओर मुड़ा और गुलर का वृक्ष नजर आया। हमारी आहट पाते ही कें कें करते बगुले और जांघिल का झुण्ड भाग चला। मन चिड़चिड़ा उठा। क्या इन परिश्रम के बाद इन्हीं के दर्शन होने थे। चार कदम और आगे बढ़ा कि फों....फों.... की भयानक फुंफकार उठी। मैं चकित हो थम गया और नजर गड़ाकर देखने लगा।



पलामू नेशनल पार्क में ‘बाइसन’

१५-२० फीट की दूरी पर, ठीक गुलर की छाया के नीचे, ऊंचे-ऊंचे घास के बीच अपना विशाल सिर उठाये वह बैठा था। उसने सिर हिलाया मानो कहा, “भाग जाओ”। जिसे मैं पहली नजर में सूखी लकड़ी का टूठ समझ बैठा था, वह बाइसन (गवर) का फैला विशाल सिंघ का ऊपरी भाग था। वह मुझे अपलक देख रहा था, कुछ क्रोधित सा। मैंने उसके आराम में खलल पहुंचाई थी। इतने ही में उसने फैली टांगें मोड़ ली और उठने की तैयारी की। मैं भी पीछे हट गया और नाले के घुमाव की ओट में छिप गया।

सब ओर शान्ति थी। मेरे पीछे आता वन-रक्षी कुछ कहना चाहता था। इशारे से हम लोगों ने अगला कदम उठाने के पहले विचार-विमर्श किया। प्रश्न था किस प्रकार बाइसन के पीछे मैं जाऊं। वह उठकर खड़ा हो और मेरे कैमरे के लिए एक उम्दा पोज दे। कई एक प्लान तेजी से दिमाग में आये और रद्द किये गये कि पाठक बोल उठा “गवर”। देखा तो मुंह मांगे पोज में वह हमसे २० फीट की दूरी पर खड़ा था। आंखें विश्वास नहीं कर रही थीं और उधर हिम्मत जवाब देने लगी थी। मेरे हृदय की धड़कन बिना किसी यन्त्र के सहारे वह सुन रहा था। कैमरा उठाया, नजर मिलाई और “क्लिक”। गवर रौंदता सामने से निकल गया और दूर भाड़ी में जा “थैंक यू” के पोज में सिर टेढ़ा कर देखने लगा।

पर्सोने ने पुनः चश्मे पर कब्जा जमा लिया था। ईश्वर और बाइसन दोनों को धन्यवाद देता किनारे पर चढ़ने लगा। जीप कुछ दूरी पर थी। रास्ते भर बार-बार उसी का पोज नजर आता रहा। फिर कैमरे की ईमानदारी पर शक होता रहा, पर नतीजा आपके सामने है। प्रश्न है क्या बाइसन भी फोटो का इच्छुक था ?

—लक्ष्मीकान्त पाण्डेय

वन्य जन्तु संरक्षण की ओर

सन् १९६३ के ग्रीष्मावकाश की बात है। मैं राजस्थान में अध्यापक था और छुट्टियाँ बिताने हरिद्वार आया था। पं० हरिवंश जी के साथ जंगल में घूमने और वहाँ रातें बिताने का बड़ा लोभ रहता था। पण्डित जी भी अब दिल्ली में अध्यापक हैं और उनके भी हरिद्वार आने का यही समय होता है। जैसे ही उनके आने का पता लगा, मैं फौरन उनसे मिलकर कार्यक्रम तय कर आया। पं० विद्यानिधि जी, जो वनभ्रमण वालों में सबसे वयोवृद्ध एवं सबका उत्साह बढ़ाने वाले हैं, भी हमारे साथ थे। निश्चित दिन हम एक सज्जन के यहां से पण्डित जी का भाला लेने गये तो एक १२-१३ वर्ष का बालक जो दिल्ली से छुट्टियाँ बिताने आया था हमारे साथ जाने की हठ करने लगा। हरिद्वार में जहाँ हम इकट्ठे हुए वहाँ सभी ने उस बालक को निरुत्साहित करने का प्रयत्न किया पर वह बहुत दृढ़ निकला और उसे छोड़ना सम्भव न हुआ।

अन्धेरा पड़ने तक हम सिद्धाश्रम में बनी साधु की भोंपड़ी पर जा पहुंचे। रात अन्धेरी थी। लगभग ११ बजे कोई इक्कड़ हाथी हमसे १०० गज या इससे कुछ अधिक दूरी पर आकर बाँस खाने लगा। बालक भय के कारण पं० हरिवंश जी से चिपट गया। भय के कारण हमारा भी बुरा हाल था। न जाने कब दुष्ट इक्कड़ भोंपड़ी की तरफ आ जाय। इस भोंपड़ी पर उसने पहले भी कई बार आक्रमण किया था और एक बार तो बेचारे साधु बाबा ने भोंपड़ी में आग लगाकर अपनी जान बचाई थी। आते समय रास्ते में हम इन्हीं घटनाओं की चर्चा करते हुए आये थे। पं० विद्यानिधि जी अपनी बन्दूक भरे आगे होकर तैयार बैठे एक-एक आवाज को बड़े ध्यान से सुन रहे थे। पण्डित जी को बन्दूक खरीदने के लिए भी इसी दुष्ट इक्कड़ ने इसी स्थान के पास पिछले वर्ष विवश किया था जबकि उसने रात में एक बहुत छोटे वृक्ष पर बनी मचान पर बैठे उनके और अन्य तीन लड़कों के प्राणों को संकट में डाल दिया था और हैट तथा जूतों पर तो अपना क्रोध उतार ही डाला था।

सारी रात भय तथा आतंक की छाया में बीती। हाथी बाँस के भुरमुटों को खाता हुआ हमारी तरफ ही बढ़ रहा था। रात बड़ी लम्बी प्रतीत हो रही थी। अन्धेरी रात में मनुष्य ही सबसे असहाय तथा अन्धा होता है। बन्दूक से हाथी के विरुद्ध सफल होने की सम्भावना बहुत कम थी क्योंकि यहाँ का इक्कड़ कत्थे

के झालों पर आक्रमण कर ऐसे अनुभव बहुत कर चुका था। प्रातः तीन बजे के लगभग बांस तोड़ने की आवाजें आनी बन्द हो गयीं और अब भय और बढ़ गया कि कहीं वह निःशब्द घात लगाता हुआ बहुत पास ही न आ गया हो।

प्रातः ४॥ बजे हम लोग तैयार होकर आगे चले। आगे पहाड़ी की जड़ में रास्ता गोलाकार घूमा था और मोड़ समाप्त करते ही हाथी सड़क की बगल में थोड़ी निचाई पर खड़ा दिखाई दिया। हमें देखते ही वह मुड़कर सड़क पर आया और हम शोर मचाते हुए पीछे भागने को हुए पर हाथी सड़क पर आते ही विपरीत दिशा में भाग गया। हम एक सनसनीखेज अनुभव से बंचित रह गये। इस हाथी के दांत नहीं थे अतः या तो हथिनी होगी या मकना। इसके बाद जब हम और आगे बढ़े तो एक सुन्दर दृश्य देखने को मिला। कुछ चीतल जिनमें नर, मादायें दोनों थे, कुछ सांभर व एक काकड़ जो एक पहाड़ी के नीचे इकट्ठे खड़े थे हमें देखकर भागते हुए ऊपर चढ़ गये। काकड़ के पूँछ खड़ी करके ऊपर चढ़ने से हमारा खूब मनोरंजन हुआ। उस दिन हम २०-२२ मील चले। वह बालक इसके बाद एक बार फिर हमारे साथ गया और इस बार भी लगभग इतना ही चला। उसे सदा के लिए शौक हो गया था।

वनभ्रमण की उपरोक्त घटना मैंने कहानी सुनाने मात्र के लिए नहीं लिखी है। मेरा उद्देश्य उस बालक की प्रवृत्ति को दिखाना है। उसके हठ का मूल कारण पं० हरिवंश जी ही थे जिनका वह सम्बन्धी था और उनके वनभ्रमण के बहुत से अनुभवों को सुन चुका था। उसका भाग्य देखिये कि पहला ही अवसर कितना सफल रहा। उस दल में एक और बालक राजस्थान का भी था जो मुझसे वनभ्रमण की अनेक मनोरंजक तथा भयवर्धक घटनायें सुन चुका था। ये दो ही नहीं और बहुत से उदाहरण मेरे सामने हैं। स्वयं मैं भी दूसरों की आपबीती घटनाओं का हाल सुनकर वनभ्रमण में प्रवृत्त हुआ। घटना तथा वर्णन शैली का इतना प्रभाव देखा गया है कि डरपोक व्यक्ति भी जंगल में घूमने के लिए तैयार हो गये हैं।

वन विभाग के कार्यकर्त्ता तथा जंगल में कार्य करने वाले अन्य लोग जिनकी जंगली जन्तुओं से मुलाकात और मुठभेड़ें होती रहती हैं, उनको एक प्रकार की विपत्ति समझते हैं और इस बात से अनभिज्ञ होते हैं कि उनके साथ घटी घटनाओं का वन्य-जन्तु-संरक्षण तथा वनभ्रमण की प्रवृत्ति के प्रसार में कितना लाभकारी प्रभाव हो सकता है। वन विभाग के अधिकारियों, पुराने शिकारियों और प्रकृति के अध्ययन-कर्त्ताओं द्वारा प्रस्तुत वन्य पशु-पक्षियों सम्बन्धी मनोरंजक, दुस्साहसिक और जीव वैज्ञानिक तथ्यों की कहानियों, अपने कर्त्तव्य के पालन में लगे वन विभाग के कर्मचारियों तथा अन्य लोगों की वन्य पशुओं से हुई मुठभेड़ों, वन्य पशुओं की गणना के समय प्रस्तुत हुए दृश्यों तथा घटनाओं का संकलन कर उन्हें पुस्तक के रूप में प्रकाशित किया जाये और छात्रों के अध्ययन के लिए उपलब्ध कराया जाय। वन्य जन्तु संरक्षण में रुचि रखने वाले ऊपर लिखे सज्जनों द्वारा स्कूल, कालेजों में वार्तायें तथा व्याख्यान दिलाये जायें, उनके नेतृत्व में छात्रों के जंगल कैम्प लगाये जायें और इस प्रकार वनभ्रमण एवं वन्य जन्तु संरक्षण को स्काउटिंग के समान एक सह-शैक्षणिक गतिविधि (Co-curricular activity) का रूप दिया जाना चाहिए।

मैं जिस संस्था में कार्य करता हूँ इसकी भी वनभ्रमण की बड़ी पुरानी परम्परा है। संस्था की स्थापना जंगल में हुई थी जहाँ हाथियों से तेन्दुए मारे जाते थे। छात्र जंगल में जाकर अंबेरी रातों में नाले की रेत पर लेटते जहाँ से हाथी और शेरों का रास्ता होता था। एक बार वे एक हाथी का बच्चा भी पकड़ लाये थे। पं० विद्यानिधि जी, पं० हरिवंश जी और विराज जी उसी समय की देन हैं। वन का प्रेम उनमें कूट-कूटकर भरा है। आज ६६ वर्ष की आयु में भी निहत्थे हाथियों के पीछे घूमने में वे किसी नवयुवक से पीछे नहीं हैं। अपने कार्यों और लेखनी से वन्य जन्तु संरक्षण में ही लगे हैं।

जब संस्था वर्तमान स्थान पर आ गई तब भी छात्र बराबर वन में घूमने तथा रातें बिताने जाते रहे। यद्यपि परम्परा अब क्षीण पड़ गई है किन्तु प्रोत्साहन पाकर छात्र अब भी वे कार्य कर सकते हैं। इसी जनवरी मास में छात्रों के एक दल ने एक ऊबड़-खाबड़ घास तथा बाँसों से भरी पहाड़ियों वाली घाटी में दिन भर हाथियों के पीछे दौड़ लगाकर एक बार फिर ३०-३५ वर्ष पुरानी घटनाओं की याद ताजा कर दी। वास्तव में छात्र उन हाथियों को खूब पास से जी भर कर देखना चाहते थे और घबराहट के मारे होश गुम थे। चार हाथी जिनमें एक दंतेल भी था डरकर पूँछ उठाये भागे ही चले जा रहे थे और अन्त में चकमा देकर गायब हो गये। आध घंटे बाद एक दूसरे सोत में दो हथिनियाँ जिनके साथ एक बच्चा भी था सामने आ गयीं। वहाँ भी कसर इतनी रही कि छात्रों को बच्चा पकड़ने के लिए उकसाया नहीं गया तो इस घटना की पुनरावृत्ति भी सम्भव थी।

अवश्य ही ऐसी और भी कई संस्थायें होंगी जहाँ ऐसी परम्परा होगी। इन सबके अनुभवों को एकत्र करना वनभ्रमण वालों के परिवार को बढ़ाना और वन्य जन्तु संरक्षण के समर्थकों को बढ़ाना है।

वन्य जन्तु संरक्षण के लिए स्कूल कालेजों द्वारा जंगल कैम्प लगाना बड़ा महत्त्वपूर्ण है। प्रसन्नता का विषय है कि बहुत से प्रसिद्ध स्कूलों में जंगल कैम्प लगाने की प्रवृत्ति बढ़ रही है।

किशोर अवस्था में दुस्साहसिक कार्य की प्रवृत्ति जितनी अधिक होती है उतनी अन्य में नहीं। इस आयु में जंगल कैम्प में बिताये गये कुछ दिन तथा प्राप्त किये हुए अनुभव चिरस्मरणीय रहते हैं। वे जब भी उस अवसर को याद करते हैं उन्हें एक विशेष प्रकार के आनन्द का अनुभव होता है। इस प्रतिक्रिया से कितने ही छात्र प्रकृति की तरफ खिंचेंगे। प्रकृति से, जंगल से, जंगली जानवरों से प्रेम उनके मन में पैदा होगा—वन्य जन्तु संरक्षण के समर्थक बढेंगे। मैं बहुत से ऐसे सज्जनों को जानता हूँ जिन्हें किशोर अवस्था में जंगलों में घूमने का अभ्यास पड़ा था। ये लोग अब वन्य जन्तुओं की बेहिसाब हत्या के विरुद्ध हैं और वन्य जन्तुओं से बड़ा प्रेम रखते हैं। शेर तथा खूनी हाथी जैसे प्राणियों की वे जंगल में रोमांच पैदा करने के लिए आवश्यकता महसूस करते हैं।

इस बार अक्टूबर '६६ में बिरला पब्लिक स्कूल, पिलानी के छठीं-सातवीं कक्षाओं के छात्र सिद्धाश्रम के जंगल में २-३ रात मचान पर रहे। उन्होंने इक्कड़ हाथी, शेर, रीछ आदि को देखा और बहुत प्रसन्न और सन्तुष्ट होकर गये। क्या ये छात्र अपने जीवन भर उस दृश्य को भूल सकेंगे जबकि मचान की तरफ

जाते समय रास्ते में टीले पर खड़े शेर का साक्षात् हुआ था। इन छात्रों में से कोई यदि पुनः किसी ऐसे जंगल में आये जहाँ कोई जन्तु न हो तो उसे कितनी निराशा होगी।

सरकार द्वारा राष्ट्रीय पार्क तथा सैंक्चुअरी की स्थापना अत्यन्त सराहनीय कदम है जहाँ न केवल समाप्तप्रायः जन्तुओं के बचाव तथा पुनर्स्थापना की व्यवस्था ही नहीं बल्कि दर्शकों के लिए सभी सुविधायें भी प्रस्तुत हैं। किन्तु हममें से कौन ऐसा है जो यह चाहता हो कि जन्तु केवल पार्क तथा सैंक्चुअरी में ही रह जाएं, शेष वनों में से उनका नाम निशान मिट जाय। राष्ट्रीय पार्क आदि की सैर अत्यन्त व्ययसाध्य है। सर्व साधारण उसका लाभ नहीं उठा सकते। साथ ही वहाँ का दृश्य भी नकली है। इन स्थानों पर वन्य जन्तुओं को देखने वाला व्यक्ति यह जान ही नहीं सकता कि वन्य जन्तुओं का निर्दयतापूर्वक नाश किया जा रहा है कि नहीं; और यदि हाँ, तो कैसे? हमारा मूल उद्देश्य तो सभी स्थानों पर वन्य जन्तुओं का संरक्षण है और इस उद्देश्य की पूर्ति केवल पार्क तथा सैंक्चुअरी की स्थापना करके नहीं होती। मैं इनको व्यर्थ नहीं मानता किन्तु हमारे प्रयत्न इन्हीं तक सीमित नहीं रहने चाहियें—वे सभी प्रकार के वनों तक पहुंचने चाहियें। व्यक्तिगत वनों तक भी जिनके लिए यह सिद्धान्त हो कि भूमि आपकी है, वृक्ष भी आपके हैं किन्तु जन्तुओं को मारने की स्वतन्त्रता आपकी नहीं। ठीक उसी प्रकार जैसे मन्दिर या मस्जिद किसी व्यक्ति विशेष के हों किन्तु पूजा का अधिकार सबको हो।

सरकार ने कुछ विशेष जन्तुओं के शिकार पर कानून द्वारा प्रतिबन्ध लगा दिया है किन्तु उस कानून का पालन हो रहा है या नहीं, यदि हाँ तो वे जन्तु बढ़ रहे हैं या नहीं? यदि नहीं, तो क्यों? ये बातें राष्ट्रीय पार्क से कभी ज्ञात न हो सकेंगी। निर्दयतापूर्ण कत्लेआम का ज्ञान सभी तरह के वनों में जाकर ही हो सकेगा।

यदि मान लें कि वन्य जन्तु संरक्षण शत-प्रतिशत सफल रहता है और समाप्तप्रायः जन्तु फिर बढ़ जाते हैं तो उनके होने का आनन्द लेने के लिए भी हमें जंगल में जाना ही चाहिए। यदि हम वहाँ नहीं जाते तो चाहे वहाँ हजार चीतल हों या एक भी न हो, क्या अन्तर पड़ता है? वन्य जन्तु संरक्षण का अभिन्न अंग वनभ्रमण है जिसके द्वारा हम जन्तुओं के होने का आनन्द प्राप्त करते हैं और न होने का शोक करते हैं। एक ऐसा जंगल जिसके सारे जीव जन्तु मार डाले गये हैं, उस जंगल से कैसे भिन्न हैं जिसमें सभी प्रकार के जन्तु उपस्थित हैं किन्तु उन्हें देखने कोई नहीं जाता? यह कहावत सही है कि “जंगल में मोर नाचा, किसने देखा”—अर्थात् व्यर्थ गया। ऐसी सुन्दर वस्तु को व्यर्थ न जाने देने के लिए हमें जंगल में जाकर उसे देखना चाहिये। वन्य जन्तु संरक्षणवालों को जंगल में जाना चाहिये, बार-बार जाना चाहिये, जन्तुओं का निरीक्षण अध्ययन करना चाहिये। पीछा करके उनकी एक-एक गतिविधि को जानना चाहिये, ज्ञान-विज्ञान को समृद्ध करना चाहिये। पशु मनोविज्ञान के क्षेत्र में अभी बहुत कुछ करना शेष है—इस पर साहित्य का नितान्त अभाव है। उचित हो तो शिकार भी किया जाय। पर ड्राइंग रूम में बैठकर कुछ लेख आदि पढ़ लेने और २-४ पुस्तकों की मदद से एक दो लेख लिख मारने से वन्य जन्तु संरक्षण नहीं होने वाला है।

जंगली पशु-पक्षियों को देखना जितना आनन्ददायक है उससे कहीं अधिक उनके शब्दों को सुनना है। आवाजों के आधार पर जंगल के रहस्यमय गर्भ में चलने वाले नाटक के बारे में अनुमान लगाना अत्यन्त मनोरंजक है। यह आनन्द चिड़ियाघर में कभी भी प्राप्त नहीं हो सकता।

इसके लिए सभी जंगलों में उपयुक्त स्थानों पर बड़े-बड़े वृक्षों पर हरियाली से ढकी, बैठने या रहने की जगहें होनी चाहियें जहाँ व्यक्ति दिन व रात में छिपकर वन्य पशुओं को देखें, सुनें।

छात्रों के कैम्प राष्ट्रीय पार्कों में तो जाते ही हैं, अन्य जंगलों में भी जाने चाहियें। नागरिकों को भी ऐसे कैम्पों का आयोजन करना चाहिये। और कुछ नहीं तो सैक्चुररी तथा सामान्य वन की तुलना ही हो जायेगी। वन्य जन्तुओं के नाश के कारण और तरीकों का पता चलेगा। वन की भयंकरता, शान्त वातावरण और सुन्दर प्राकृतिक दृश्य अनुभव करने तथा आनन्द लेने की वस्तु हैं।

बहुत से लोग वन तथा वन्य जन्तुओं से डरते हैं। उनका अधिकांश भय काल्पनिक तथा विषयगत है। भय का कारण उनके हृदय में ही है, जंगल में नहीं। वहाँ कुछ विपत्ति अवश्य है पर वह इतनी नहीं है जितनी कल्पना उसे बढ़ा-चढ़ा देती है। २-४ बार की सैर से यह भ्रम दूर हो जाता है। तब केवल उतना ही भय शेष रहता है जितना उचित है।

भय जैसे मूल प्रवृत्तिजन्य एवं आदिम संवेग पर विजय का आध्यात्मिक संघर्ष भी वन में ही जाकर किया जा सकता है।

वन भ्रमण वन्य जन्तु संरक्षण में प्रवृत्त करता है। यहाँ तक कि खून के प्यासे शिकारी भी बाद में जन्तुओं के अभाव में दुखी होते हैं। वन्य जन्तु संरक्षण वनभ्रमण में प्रवृत्त होना चाहिये। एक के बिना दूसरा अधूरा है। इसलिये यदि वन्य जन्तुओं के संरक्षण के लिये जनमत बनाना है, तो अधिक से अधिक लोगों को जंगलों में घूमने तथा घुमाने का प्रयत्न किया जाना चाहिये।

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